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PROCEEDINGS OF THE TRADOC/TRAINING DEVELOPMENTS INSTITUTE (6TH)--ETC(U)
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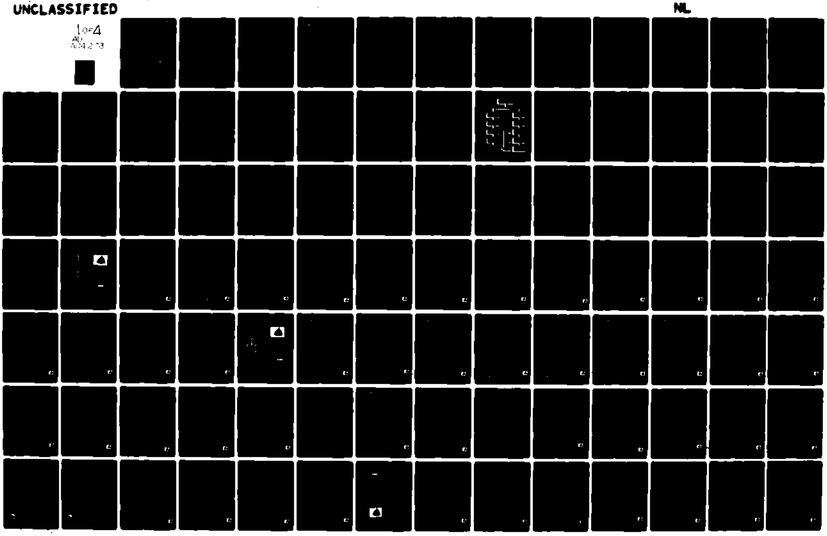

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18. SUPPLEMENTARY NOTES

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19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

FRONT END ANALYSIS
JOB ANALYSIS
TASK ANALYSIS
CRITICAL TASK SELECTION
SOFT SKILL ANALYSIS
EVALUATION/ANALYSIS
BASIC SKILLS EDUCATION PROGRAM

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The proceedings represent the presentations made at the Sixth TRADOC Chiefs of Analysis Seminar held at the Ramada Inn, Virginia Beach, VA; 21-23 October 1981. The primary theme of this seminar was Front End Analysis (FEA) for New Systems. The intent of this seminar was to provide a forum to address training analysis issues, to consider the current state-of-the-art activities within front end analysis/performance technologies, to resolve problems within the TRADOC community attendant to each, and to allow service school chiefs of analysis to interact with the ORAD staff (TRADOC proponent for front end analysis policy and training.

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DEPARTMENT OF THE ARMY
TRAINING DEVELOPMENTS INSTITUTE
FORT MONROE VIRGINIA 23651

ATTG-DOR

TO: Seminar Attendees

SUBJECT: Letter of Transmittal, Proceedings of the TRADOC/Training Developments Institute Chiefs of Analysis Seminar, 21-23 October 1981

1. Inclosed you will find a summary of proceedings of the 6th Chiefs of Analysis Seminar, in which you participated, during the period 21-23 October 1981. The primary theme of the seminar was Front-End Analysis (FEA) for New Systems.

2. The summary consists of two elements; an Executive Summary of the activity, to include a complete list of attendees and participants; and abstracts of each presentation with paper copies of slides and supporting narratives/papers. The purpose of this letter is to act as a mnemonic such that those topics of special interest to you may be pursued with the responsible individuals.

3. Additional copies of the proceedings will be available in the near future through Defense Technical Information Service. Limited copies can be obtained from this office, ATTN: ATTG-DOR.

1 Incl
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MARK T. PILGRIM
LTC, AR
Chief, Occupational Research and
Analysis Division

PROCEEDINGS OF THE 6TH CHIEFS
OF ANALYSIS SEMINAR
21-23 OCTOBER 1981
VIRGINIA BEACH, VIRGINIA

1. The 6th Chiefs of Analysis Seminar was held at the Ramada Inn, 57th and Oceanfront, Virginia Beach, Virginia from 21-23 October 1981. The primary theme of this seminar was: Front-End Analysis (FEA) for New Systems.

2. The sponsor of this seminar was the Occupational Research and Analysis Division (ORAD) of the Training Developments Institute (TDI), Fort Monroe, Virginia 23651. The project officer/seminar coordinator was Mr. Bernard P. Silverberg (telephone: AUTOVON 680-4425, AC (804)727-4425).

3. The purpose of this seminar was to provide a forum to address training analysis issues, to consider the current state-of-the-art activities within front-end analysis/performance technologies, to resolve problems within the TRADOC community attendant to each, and to allow service school chiefs of analysis to interact with the ORAD staff (TRADOC proponent for front-end analysis policy and training).

4. Seminar presentations are summarized herein and copies of vu-graphs, narratives, etc., are provided as inclosures. Unless so indicated, the content of these presentations does not necessarily reflect official TRADOC views on the subject. The intent of the seminar was to permit the service schools and invited speakers to present their opinions on varied subjects and solicit feedback to better our analysis efforts.

5. The agenda is attached at Incl 1. A list of attendees is at Incl 2.

6. Executive Summary of Proceedings.

a. Welcoming/Opening Remarks (BG Frederic Brown, Deputy Chief of Staff for Training. COL F. A. Nerone, Director, Training Developments Institute. LTC Mark T. Pilgrim, Chief, Occupational Research and Analysis Division): LTC Pilgrim welcomed the seminar attendees to Virginia Beach, VA for the 6th TRADOC Chiefs of Analysis Seminar. He introduced COL Nerone, who in turn introduced BG Brown. BG Brown addressed the issue of training development, especially front-end analysis, within the new systems acquisition process. He emphasized that a detailed front-end analysis data bank will be developed for each new system acquisition, either concurrently with the development of the system or after the system has been developed. He challenged the attendees to develop the most comprehensive data base possible for the development of new system training products in an efficient manner with the resources available.

b. Planning FEA (Dr. Joe Harless, Harless Performance Guild): Dr. Harless presented an overview of analysis techniques for human performance. He differentiated between Diagnostic FEA and Planning FEA by emphasizing that Diagnostic analysis is performed on existing, on-line, systems/jobs/tasks and Planning analysis hypothesizes problems or deviations from mastery on a non-existent or programmed items, situations, tasks, etc. He detailed his methodology for performing Planning analysis by providing the

attendees worksheets, discussing their utility, and explaining the process theory. Also discussed was the correlation between the analytical process and the design phase of the ISD. Supporting outline and forms are at Incl 3.

c. Current TDI-ORAD Staff FEA Efforts (Dr. Al Longo, CPT(P) Ron Tarr, MSG Donald Mitchell, Mr. Bernard Silverberg):

(1) CPT(P) Tarr presented an update on his efforts for improving the Extended Task Analysis Procedures (ETAP). He also described his efforts in developing a training course for ETAP; coordinating with CAC and ATSC on collective analysis; brainstorming needs analysis as a part of FEA; coordinating with the Air Defense School on evaluation training; and performing school assistance visits. BSEP MOS Baseline activities were also discussed.

(2) Dr. Longo presented a detailed update on his efforts with BSEP Word Criticality Analysis and In-Training Actuarial Student Prediction. The In-Training Actuarial Student Prediction Project is an exploratory study to determine the feasibility of using student actuarial data for in-training prediction purposes. In addition, he provided an update on TDI developments relating to administrative policy/procedures in support of AOSP questionnaire development. This covered two major areas: (1) Revision of TRADOC Supplement to AR 611-3 (AOSP); and (2) the AOSP training module to the JTA workshop. Supporting slides are at Incl 4.

(3) MSG Mitchell discussed his efforts in developing the Army Training Executive Workshop (ATEW) and plans for its implementation and improvement. He also described his efforts in developing an executive desk reference to be used by the DTD in performing their mission. The development of a yardstick for performing analysis was discussed. The yardstick will provide a means of projecting manpower requirements for performing the four types of FEA: (1) revision on an existing analysis; (2) new analysis; (3) new systems analysis; and (4) soft skill analysis. In addition, activities in preparing for the 7th Chiefs of Analysis Seminar and TDI representation in the National Society for Performance and Instruction were discussed.

(4) Mr. Silverberg discussed his activities of coordinating with the Army Logistics Management Center in developing the SPAS Workshop for Contractors. This workshop, a joint DARCOM-TRADOC effort, will provide SPAS contractors a systematic process for developing the initial draft of TM. Also discussed was the evaluation of effectiveness and usefulness of TRADOC Pam 351-4(T), Job and Task Analysis Handbook. The schedule for revising TRADOC Pam 351-4(T), TRADOC Pam 351-6, and the JTA Workshop was also presented.

d. HARDMAN Methodology/Early Training Estimation System (ETES) (Dr. Larry O'Brien and Mr. Tom Mannle, Dynamics Research Corporation):

(1) Four presentations were delivered during this session. The first session provided an overview of the concept of "front-end analysis" and described why there is a need for conducting such analyses during the earliest phases of the system acquisition process. The second presentation provided a

general description of the HARDMAN methodology, which is an integrated methodology for assessing manpower, personnel, and training requirements for developing weapon systems. The third presentation provided an overview of Step 3 of the HARDMAN methodology: the Training Resource Requirements Analysis (TRRA). The fourth presentation described the Early Training Estimation System (ETES) which is a research and development effort to develop a data base management system for task and training-related data and a systematic set of procedures for estimating training requirements during the earliest phases of the system acquisition process.

(2) All four presentations are based upon work conducted for the Army Research Institute by Dynamics Research Corporation (DRC). Mr. Tom Mannle of DRC was the speaker for the first two presentations, while Dr. Larry O'Brien was the speaker for the final two presentations.

(a) PRESENTATION 1: INTRODUCTION TO FEA FOR NEW SYSTEMS

Two slightly different definitions for front-end analysis (FEA) were identified: (1) FEA for ISD which is defined as the initial analysis which must be conducted to feed the ISD process and (2) FEA for acquisition which is defined as the analysis of manpower, personnel, and training requirements which must be conducted during the early phases of the acquisition process in order to support the system design and plan for training products. It was pointed out that the remaining portion of the session would be devoted to FEA for new system acquisition (as defined above). After these basic definitions were provided, doctrinal requirements for FEA (both implicit and explicit) were examined. Finally, potential problems surrounding the conduct of FEA in the current acquisition environment were identified.

(b) PRESENTATION 2: HARDMAN METHODOLOGY

1 This presentation described the application of the HARDMAN methodology to an emerging Army system, the Enhanced Self-Propelled Artillery Weapon System (ESPAWS).

2 The HARDMAN methodology is a structured approach to the determination of the manpower, personnel, and training (MPT) requirements of a weapon system in the earliest phases of its development. The problems of high support costs and low levels of readiness associated with current weapon systems are, in many cases, due to the unfavorable impacts of design on MPT. This situation may be attributed, in part, to the failure of designers to take into account the MPT effects of their design decisions. This failure has two causes: (1) the lack of policy/procedural requirements for designers to give MPT equal consideration with cost, schedule, and performance, and (2) the lack of analytic tools equal to the task. The acquisition policy reforms of the mid and late 1970's have provided the first of the "missing links;" the HARDMAN methodology is one example of the second.

3 The HARDMAN methodology was initially developed for Navy applications and has since been applied to a wide range of Navy systems.

Recently, it was modified for use in Army manpower, personnel, and training analyses. This presentation described the results of the initial Army application to the ESPAWS system.

4 The basic analytic approach of the HARDMAN methodology is comparability analysis. The functional requirements of the desired systems are used to configure two design concepts: (1) a conceptual, or baseline system, employing low risk technological advances likely to be extant at the time desired for system's Initial Operational Capability, and (2) a reference system which also satisfies the system functional requirements, but does so using presently developed equipment. Data is collected on the two concepts to identify the design differences. It is these "deltas" which allow the MPT requirements of the conceptual system to be established by extrapolation from the generally known requirements of the reference system.

5 The HARDMAN methodology consists of six steps. Step 1 develops the conceptual and reference system designs, establishes the consolidated data base, and calculates the design differences. Steps 2, 3, and 4 are multidisciplinary, flexible format analyses which estimate the demand for manpower, personnel, and training resources by both the conceptual and reference systems. Step 5 compares these demand estimates to the known or projected available ability of these resources, either currently or at some point in the future. Significant shortages, new requirements, and "high drivers" of MPT resources are identified as a result of this comparison. In Step 6 alternatives to reduce or eliminate unfavorable MPT impacts this identified are generated, and the methodology is iterated to evaluate one or more alternatives. In the ESPAWS project, only the first four steps, i.e., only the demand side of the MPT equation, were applied.

6 After presenting an overview of the HARDMAN methodology, five of the six HARDMAN steps were described in detail. (Step 3: Training Resources Requirements Analysis, was described in detail during the third presentation.)

7 After describing the steps of methodology, the "lessons learned" from the initial application of the HARDMAN methodology to the ESPAWS were identified. The major finding was that the HARDMAN methodology can provide meaningful estimates of MPT resources required to support an emerging Army weapon system. Potential areas improvement in the methodology are being evaluated in a second, more complex analysis of the ESPAWS.

(c) PRESENTATION 3: TRAINING RESOURCE REQUIREMENTS ANALYSIS

1 During this presentation, a detailed description of Step 3 of the HARDMAN methodology, Training Resource Requirements Analysis (TRRA) was presented. The presentation began with a discussion of the reasons for estimating training requirements during the early phases of the system development/acquisition process so that design can be properly influenced with training-related considerations and training products can be properly planned; the major objective of ISD is to actually develop training products; (b) the TRRA initially focuses only on those areas related to design impacts,

whereas ISD attempts to encompass the total system from the outset; and (c) TRRA attempts to utilize existing data, whenever possible, while ISD requires the generation/use of data for the new or emerging system.

2 After a discussion of these basic concepts, the major mechanisms and steps of the TRRA were discussed. The approach of the training compara bility analysis is similar to that for equipment. The analyses began with the development of a training program for the reference system which is a compilation of the existing subsystems which most closely meet the functional requirements of the new system. This reference training program is specified in as much detail as the available data permit. It includes the tasks required to operate and maintain the system and those tasks to be trained; course information such as major media, methods of instruction, and instructor contact hours; resource data such as instructor determination algorithms, other estimating relationships, and training scenario information; and cost data, particularly individual student costs. The reference training program, thus established, is then modified to reflect the impact of design differences between the reference and conceptual systems. The result is the conceptual system training program.

3 One of the outputs of the conceptual system training program is detailed information on any new or modified courses required. Since design differences may take the form of either modifications to existing equipment (to incorporate evolutionary improvements) or replace or addition of components ponents (to take advantage of new technology), the courses developed for the ESPAWS conceptual system reflected this distinction. They were either modifications of existing courses, or entirely new courses developed to meet the training requirements of the specific equipments chosen for the ESPAWS conceptual system.

4 Instructor requirements are another output of the training analysis. These estimates can be calculated from standand algorithms which use course information such as course length, student/instructor ratios, and contact hour requirements. In addition, an estimate of the throughput personnel the training establishment must accommodate is determined. The estimate of training throughput personnel is derived from the overhead personnel requirement caluclated in the Personnel Analysis step of HARDMAN methodology.

5 Finally, training course costs are estimated utilizing the personnel requirements described above.

6 Following a description of the analytical steps of the TRRA, potential limitations of the current TRRA were identified. It was pointed out that procedures for dealing with most of these limitations are currently being developed in the ETES study.

(d) PRESENTATION 4: EARLY TRAINING ESTIMATION SYSTEM (ETES)

1 ETES is a 3-year research and development effort sponsored by the Army Research Institute (ARI) to develop a comprehensive system for estimating

training requirements during the earliest phases of the system development/acquisition process. This presentation described the results of the first year of the ETES study.

2 The Early Training Estimation System (ETES) is designed to deal with two major deficiencies in existing technologies: (1) the lack of a systematic tool for describing, storing, and updating system concepts and for transmitting this information to all of the various participants in the development/acquisition process and (2) the lack of a comprehensive set of training analysis tools which are appropriate for the early phase of design. The ETES will have four major components: a System Description Technology, training estimation aids and procedures, human performance simulation models, and a User's Guide.

3 The System Description Technology (SDT) will be an automated data base management system for describing actual and projected system elements, including functional requirements, design concepts, tasks, skills, training program elements and their associated resources; for storing the above information; for changing and updating this information; and for transmitting the information among all of the participants in the acquisition process.

4 The training estimation aids and procedures will be specifically designed for early training estimation. They will include procedures (automated whenever possible) for (1) identifying comparable equipments, (2) generating and modifying tasks, (3) generating and modifying courses, (4) selecting and assigning tasks to training settings and methods, (5) determining the number of personnel to be trained, (6) determining training resources, and (7) developing training cost measures.

5 The human performance - system performance simulation models will be used to relate human task performance to system performance. The simulation models will provide the capability for trading off training-related system elements with other system elements.

6 The User's Guide will provide a detailed, step-by-step handbook describing the use of the other three tools to assess early training requirements.

7 The presentation concentrated on the SDT, the most important component of ETES. The SDT will provide a data base management tool which will be capable of describing most of the major elements of an emerging system. As such, the SDT will provide an important data base management capability that has wide ranging applicability, far beyond training-related issues.

8 The presentation provided a description of the physical and operational features of a prototype SDT concept, and described the analytical procedures underlying the development of this concept. Finally, a slide presentation of a demonstration run of the prototype SDT concept was presented. Supporting slides are at Incl 5.

e. New Systems FEA at the Air Defense School (LTC Larry Lippincott, Air Defense School): This presentation focused on new equipment FEA as it applies to putting a course of instruction on line. The following is a summary of the presentation:

(1) The Air Defense School agrees with the need for inputting training planning guidance early in the Life Cycle System (LCS). However, two concerns are:

(a) How does the training developer insure input into the LCS early on?

(b) How do you train a developer to accomplish this mission?

(2) The ISD process as it pertains to this presentation cannot be performed until the production and development phase of the LCS commences. In the concept, validation and full scale phases of the LCS, the system being developed is too dynamic, thus tasks continually change as well as the training plan. It is essential that the training developer have direct access to the contractor during this period to identify and provide timely information needed for the ISD process as well as to develop Army subject matter expertise to assist in updating the training plan of the new system.

(3) Decisions on training equipment, devices, and facilities for new weapon systems are made too early in the LCS which cause resource problems. The reason is to allow Congress the time to determine money requirements for a new system in advance. However, numbers and types of tasks drive the amount of equipment, devices, and facilities for training. Tasks cannot be determined until the equipment is available which is sometimes after the time required for Congressional action. This "best guess" often becomes concrete and difficult to change even though base production rates and IOC change. We must create a mechanism which will allow for a more flexible process for acquiring training equipment, devices, and facilities.

(4) The validation process for FEA is constrained by resources and time. Often, for a new system, courses are required to be on line by a given date to meet training requirements for IOC. However, the training developer is not provided the required system training or trained in a timely manner to fully complete the ISD process. Additionally, the training developer may not have all of the necessary information and documentation to do a complete FEA. The training developer must be allowed a close working relationship with the contractor in order to have access to information and documentation in a more timely manner and to express the training development (TD) needs. Another alternative is to provide flexiblity in IOC dates.

(5) TD personnel need to be trained so they better understand LSAR data used in job and task analysis as well as other training products.

(6) TRADOC must understand and acknowledge that the contractor does not provide data for a complete analysis of an MOS. The contractor only identifies those tasks which are system peculiar. This results in TD efforts

which are something between a new analysis and a revision as there are a number of tasks which fit between common tasks and what the contractor identifies as peculiar tasks.

(7) It is recommended that TRADOC host a work group to develop procedures/requirements for a collective and individual FEA of new systems. Additionally, TRADOC should review its LOA with MICOM to insure the trainer has an active voice in the LCS from beginning to end.

f. Impact of Regulation Change/New Regulations to FEA at the Institute of Personnel and Resource Management (MSG Don Mitchell, TDI-ORAD): MSG Mitchell highlighted the events surrounding the publication of the revised AR 340-15 and how the Soldiers Support Center, then ADMINCEN, managed to stay abreast, even ahead of TAGO, in development of a FEA data base and the associated SM and SQT revisions. The key to their success, which resulted in SM, SQT and resident courses coming "on-line" simultaneous with the publication of the new regulation, was a cooperative arrangement with the proponent for the regulation and the service school. By offering to help produce the regulation and provide field expertise, the school was able to obtain direct information on every change throughout its 2 years evolutionary process. Supporting slides are at Incl 6.

g. FEA for New and Ongoing Systems at the Field Artillery School (Mr. Taft Joseph and CPT Bill Marshall, Field Artillery School): This presentation described the Field Artillery School (USAFAS) organization, methodology and accomplishments in performing FEA for new developing systems. Organizational structure of the Analysis Division and their training development output flow was shown. Problem areas the school encountered in developing an analysis base for new system training products were discussed. Specifically, they were: (1) lack of detail with the LSAR; (2) the absence of a contract standard for the definition of a task; and (3) absence of a FEA standard or specification that a training developer can identify in a data call for writing into a contract. The USAFAS solution to these problems was the development of a Statement of Work (SOW) requiring the development of all products from a common analysis base in sufficient time and parallel with the hardware development. The SOW requires three deliverables: (1) collective-individual crosswalk; (2) individual task analysis in a Task Analysis Information Sheet (TAIS) format; and (3) and collective task outlines supporting slides and narratives are at Incl 7.

h. Soft Skills/Extended Analysis (CPT(P) Ron Tarr, TDI-ORAD): CPT(P) Tarr discussed the need for analyzing complex behaviors, or soft skills. He described how soft skill analysis is more dependent upon a comprehensive job analysis than a more traditional task analysis. This is due to the generalizability of soft skills and the need to identify them based upon job performance. Two general techniques were described, Competency Assessment (McBer) and Assessment Center Technology. Three specific techniques were recommended for use: (1) The Extended Task Analysis Procedures; (2) McBer Competency Model; and (3) Dimension Analysis Model. CPT(P) Tarr's supporting paper on this subject is at Incl 8.

i. Collective Analysis (LTC Alvin Jones, ATSC-ATB): LTC Jones discussed Collective Front End Analysis (CFEA) as described in TRADOC Pam 310-8, CFEA for ARTEP and a Methodology for Developing Drills. The first part of the presentation addressed the five part analytical model that when sequentially followed, results in an approved ARTEP task. The key feature of the CFEA is that it emphasizes the top-down analysis process starting with the Base Development Plan, threat, doctrine, etc., and through a careful analytical sequence derive the combat ARTEP tasks. The second part of the presentation dealt with the derivation of drills. The drills are analyzed as individual, collective and leader tasks that when combined and grouped together in a logical training hierarchy form the basis for drill development. The key features of the drill development methodology are the linkage to previously developed ARTEP tasks and the resultant Soldiers Manual Tasks associated therewith. Supporting slides are at Incl 9.

j. Current AOSP/CODAP Initiatives (Mr. Darrell Worstine, SSC-NCR and Dr. Al Longo, TDI-ORAD): Mr. Worstine presented an overview of the Army Occupational Survey Program (AOSP) and the Comprehensive Occupational Data Analysis Programs (CODAP). The AOSP life cycle was explained. A description of the program elements and survey content was provided. The history of CODAP development and a description of what it can provide was presented. Major problem areas within AOSP and the initiatives to correct the problems were discussed. Supporting slides are at Incl 10.

k. LSA/LSAR Directed to the Training Developer (Mr. David McChrystal, Material Readiness Support Activity (MRSA)): Mr. McChrystal described the history and purposes of Integrated Logistic Support (ILS) and how it feeds into the LSAR. He identified those LSAR input sheets and output summaries used in training development (C, D, E and G data sheets and LSAR 02 and 14 output summaries). Also described was the status of current LSA and LSAR improvement efforts. The proposed revision of MIL-STD-1388, Logistic Support Analysis, was discussed. Supporting slides are at Incl 11.

l. SPAS for New Systems (Mr. John Houlihan, ATSC): Mr. Houlihan gave a description of the "new-look" tehcnical manuals (TM), in relation to the "old style" TM. He discussed the integration of ILS and LSAR products into the development of TM (SPAS) and Extension Training Materials (ETM). He described the relationship of training development requirements to each of the four major phases of the Life Cycle Systems Management Model (Concept, Development and Validation, Full Scale Development and Production Deployment). The relationship between LSAR and training requirements was also discussed. Supporting slides and narratives are Incl 12.

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MARK T. PILGRIM
LTC, AR
Chief, Occupational Research and
Analysis Division

AGENDA

SIXTH CHIEFS OF ANALYSIS SEMINAR

21 - 23 October 1981

1. THEME: Front-End Analysis for New Systems.

2. TOPICS: The following topics will be addressed:

- Planning for Front-End Analysis (FEA)
- HARDMAN Methodology/Early Training Estimation System (ETES)
- New Systems FEA at the Air Defense School
- Impact of Regulation Change/New Regulations to FEA at the Institute of Personnel and Resource Management
- FEA for New and Ongoing Systems at the Field Artillery School
- Soft Skills/Extended Analysis
- Collective Analysis
- Current ASOP/CODAP Initiatives
- LSA/LSAR for the Training Developer
- Skill Performance Aids (SPAS) for New Systems
- Current TDI-ORAD FEA Initiatives

Wednesday, 21 October 1981

0800 - 1300	Registration	
1300	Opening Remarks	LTC Mark Pilgrim COL F. A. Nerone BG Frederic Brown
1345	Planning FEA	Dr. Joe Harless Harless Performance Guild
1515 - 1545	Break	
1545	Current TDI-ORAD Staff FEA Efforts	MSG Don Mitchell CPT(P) Ron Tarr Dr. Al Longo Mr. Bernard Silverberg
1800 - 2000	Reception	

Thursday, 22 October 1981

0800	HARDMAN Methodology/Early Training Estimation System (ETES)	Dr. Larry O'Brien Mr. Tom Mannle Dynamics Research Corporation
1130 - 1300	Lunch	
1300	New Systems FEA at the Air Defense School	LTC Larry Lippincott
1345	Impact of Regulation Change/New Regulations to FEA at the Institute of Personnel and Resource Management	MSG Don Mitchell TDI-ORAD
1415 - 1445	Break	
1445	FEA for New and Ongoing Systems at the Field Artillery School	Mr. Taft Joseph CPT Bill Marshall

Friday, 23 October 1981

0800	Soft Skills/Extended Analysis	CPT(P) Ron Tarr TDI-ORAD
0900	Collective Analysis	LTC Alvin Jones ATSC-ATB
0930 - 1000	Break	
1000	Current AOSP/CODAP Initiatives	Mr. Darrell Worstine SSC-NCR Dr. Al Longo TDI-ORAD
1130 - 1300	Lunch	
1300	LSA/LSAR Directed to the Training Developer	Mr. David McChrystal MRSA
1400	SPAS for New Systems	Mr. John Houlihan ATSC
1500	Wrap-up	

ATTENDEES
SIXTH CHIEFS OF ANALYSIS SEMINAR
21-23 OCTOBER 1981

School/Organization	Attendee	File Symbopl/Dept/Address	Telephone
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	Mr. Paul B. Keith	ATSA-TDI-C	AV 978-6000/5017
	Mr. Robert L. Williams	ATSA-TDI-R	AV 978-1643
Air Force-TAC	Ms. Maryann J. Kicinski	4444 OPS SQ, ATTN: OTD	AV 432-3115/3116
AHS	LTC Clarence C. Cooper	HSA-TOD	AV 471-6116
ALMC	Mr. Jim Barrett	DRXMC-ACM	AV 687-1786/3425
Armor	LTC John C. Pierson	ATZK-TD-ID	AV 464-7034
	Mr. Gary W. Priest	ATZK-TD-ID	AV 464-3546
ATSC	LTC Alvin T. Jones	ATIC-ATB-CT	AV 927-4651
	Mr. John C. Houlihan	ATIC-DST-SP	AV 927-4871
AVN	MAJ Alfred J. Davis	ATZQ-TD-RETO	AV 558-7111/6390
	MAJ Thomas A. Samuels	ATZQ-TD-TADD-TA	AV 558-6703/6457
CAC	CPT Mark R. Grotte	ATZL-TDP-D	AV 552-3435/2924
CGSC	LTC Ernest D. Westpheling	ATZL-SWC-P	AV 552-2127
	MAJ William R. Sharp	ATZL-SWR	AV 552-3409
CHAP	CH(LTC) Donald W. Gover	ATSC-DTD-OD	AV 992-2210/2757
	CH(MAJ) James W. Daniels	ATSC-DTD-ED	AV 992-5635/3613
CML	CPT Reece C. Edmonds	ATZN-CM-DI	AV 865-3874
	Mr. Roy D. Williams	ATZN-CM-DU	AV 865-4779/5260
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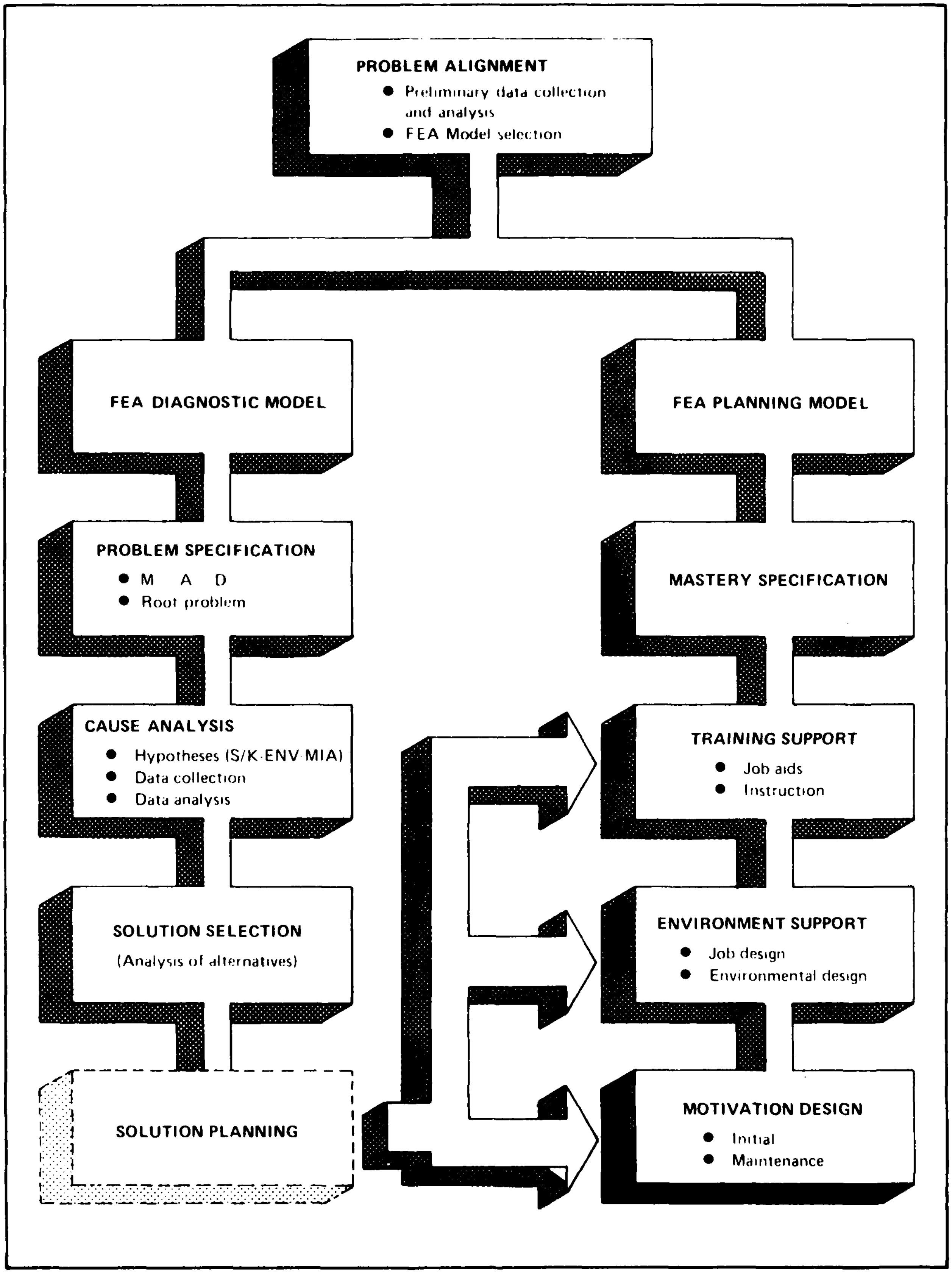
DINFOS	CPT Richard Morris	ATSX-ATL	AV 699-4338/4453
Dynamics Research Corporation	Dr. Larry O'Brien	60 Concord St.	AC (617) 658-6100
	Mr. Tom Mannle	Wilmington, MA 01887	AC (617) 658-6100
	Mr. Peter Weddle		AC (617) 658-6100
ENGR	1LT John R.F. Gallo	ATZA-TDC	AV 354-3467
	Mr. Philip E. Giambaluo	ATZA-TDC	AV 354-4063
FA	LTC Rollie D. Cook	ATSF-DT-TA	AV 639-2064/5004
	CPT William Marshall	ATSF-DT-TA	AV 639-3461
	Mr. Taft M. Joseph	ATSF-DT-TA	AV 639-3092
	Mr. Peter W.H. VanDine	ATSF-DT-TA	AV 639-2064
	Ms. Nancy L. Buel	ATSF-DT-TA	AV 639-3092
Ford Aerospace Corporation (DIVAD Division)	Mr. John Brown	2300 South Main St.	AC (714) 641-2788
	Mr. Terry Willson	Irbine, CA 92660	
	Mr. Craig Lillywhite		
	Mr. Jimmie Thompson		AC (714) 641-2579
IMA	MAJ Edward S. Jablonski	ATSU-TD-TAD	AV 236-3538
	Ms. Marilyn P. Kennebeck	ATSU-TD-TAD	AV 236-3798
Institute of Nuclear Power Operations	Mr. Rodney Thralls	1820 Water Pl.	AC (404) 95-3600
	Mr. Jerry R. Hale	Atlanta, GA 30339	AC (404) 953-7656
INF	CPT George L. Bowling	ATSH-I-V-OD-C	AV 835-7315
	Mr. Robert H. Kellett	ATSH-I-V-Q	AV 835-4052/3574
INTEL (D)	LTC Paul F. Vaupel	ATSI-ETD-AD	AV 256-3069
	CPT Susan J. Werner	ATSI-ETD-CO	AV 256-3459/2563
	Mr. John B. Angle	ATSI-ETD-AA	AV 256-3069
INTEL (H)	MAJ Allen D. Gibbs	ATSI-TD-EPA	AV 879-3925/3985
	CPT Jame A. Flesher	ATSI-TD-OTR	AV 879-3244/5406
LOGCEN	MAJ Jerry L. Crites	ATCL-TPO	AV 687-4067

School/Organization	Attendee	File Symbopl/Dept/Address	Telephone
Marines-Quantico	LTC Donald R. Frank	IMS MCDEC	AV 278-2191
M&M	MAJ Robert J. Dye	ATSK-TDA	AV 746-5307/5308
MP	Mr. Fred H. Casey	ATZN-MP-D	AV 865-3717/3901
MRSA	Mr. David McCrystal	DRXMD-EL	AV 745-3080
Music	CW3 Benny Easter MSG Gary Burk Paul Bordonaro SFC Larry Davis SFC William Jackson SFC Hugh Roberts SFC Robert Spanton SFC Donald Vavville SFC Craig Young SP6 George Pond	ATTG-SM-DTD	AV 927-9361
Navy - CNET	Mr. John W. Long	Code N934	AV 922-4201
Navy - NETPDC	Mr. George R. Mathews Mr. Albert P. Pruett	IPD1 IPD1	AV 922-1646 AV 922-1646
Navy - Special Services Administrative Activity	Mrs. Marianne C. Hoffman	UIC 66133 Potuxent NAS, MD 20670	AV 929-3861
OECS	MAJ Paul J. Rock	ATXW-RMA-TD	AV 929-6014
ORD	MAJ Arthur J. Ryan Mr. John A. Richardson	ATSL-TD-TA ATSL-TD-TMP	AV 283-4481 AV 283-2678
Planning Research Corporation	Mr. Kenneth Hed	1500 Planning Research Dr. McClean, VA 22102	AC (703) 556-1000
QM	Mrs. Janet A. Askew Ms. Beverly J. Arpin	ATSM-TDP ATSM-TDP-SV	AV 687-3770 AV 687-3636

School/Organization	Attendee	File Symbopl/Dept/Address	Telephone
SIG	COL Sidney F. Putnam	ATZH-TDP	AV 780-6652
	LTC Roy J. Barrios	ATZH-TDE	AV 780-2280/6634
	MAJ Cleveland M. Rawley	ATZH-TDA	AV 780-2005/7468
	Mr. Clarence C. Jeter	ATZH-TDP	AV 780-7388
	Ms. Doris D. Lakeman	ATZH-TDA	AV 780-7526/7311
	Mr. Jack R. Redmon	ATZH-TDO	AV 780-4895/3417
SMA	CPT John C. Vanderlaan	ATSS-TD-ITAD	AV 978-8011/8274
SSC	LTC Joseph A. DiEdvardo	ATZT-TD-O	AV 699-2717
	MAJ Mark B. Saunders	ATZI-TD-O	AV 699-2717
	Ms. Arlene M. Miller	ATZI-TD-E	AV 699-2734
SSC-NCR	Mr. Darrell A. Worstine	ATZI-NCR-MS	AV 221-9560/9083
	Dr. Maria B. Winston	ATZI-NCR-MS-I	AV 221-9109
	Mr. Alan M. Craig	ATZI-NCR-MD	AV 221-9272/0056
	Ms. Margaret L. Mercer	ATZI-NCR-MD	AV 221-9272
TDI	LTC Mark T. Pilgrim	ATTG-DOR	AV 680-3607
	CPT(P) Ronald W. Tarr	ATTG-DOR	AV 680-3607
	MSG Donald L. Mitchell	ATTG-DOR	AV 680-4425
	Dr. Alexander A. Longo	ATTG-DOR	AV 680-3607
	Mr. Bernard P. Silverberg	ATTG-DOR	AV 680-4425
	Mrs. Janet M. Lamb	ATTG-IDD	AV 680-2667
	LTC Michael B. Ahern	ATTG-PMD	AV 680-4431
	CPT Stanley Tuttle	ATTG-PMD	AV 680-4431
	Mr. James Lawson	ATTG-PMD	AV 680-4431
	LTC Daniel A. Raymond	ATTG-SFTD	AV 680-3801
TRADOC	CW4 Louis R. Lowery	ATTG-O	AV 680-3211
	CW4 Paul E. Hinman	ATTG-O	AV 680-3211
TRANS	Mr. Andrew J. Davis	ATSP-TD-AT	AV 927-2007/3172
	Mr. Richard W. Van Deren	ATSP-TD-S	AV 927-5491

OUTLINE OF THE TWO MODELS FOR FRONT-END ANALYSIS



(FEA, PLANNING) NAME: ____________________

WORKSHEET 1: ANTICIPATED PROBLEMS; MASTERY DESCRIPTION

A. What is the management goal or new situation that may require performance-supporting programs such as: Training and/or job aids; job engineering; motivational/incentive programs, etc.?

____

____

____

____

____

B. What evidence exists that the performance associated with "A" will NOT occur if the goal or new situation is implemented without performance supporting programs such as training, etc.?

- ☐ 1. Results of pilot programs show there will be deficiencies.
- ☐ 2. Similar programs in the past have failed because of lack of attention to performance-supporting aspects.
- ☐ 3. New situation is a drastic change from performance presently being done.
- ☐ 4. There is no evidence.
- ☐ 5. Other evidence: ____________________

C. What JOB TITLE is most directly and greatly affected by the new situation? ____________________

____

D. Does this situation demand:

- ☐ 1. Creation of a completely NEW job that doesn't exist.
- ☐ 2. Change the performance of an existing job drastically.
- ☐ 3. Change only one Duty or a few tasks or a few steps of an existing job.

E. Are there MASTER PERFORMERS of the tasks associated with this new situation?

- ☐ No. Therefore, the source of Mastery will be: ____________________
- ☐ Yes. The Masters are: ____________________

F. MASTERY

1. WHAT are the NEW TASKS that will be performed in new situations?	2. What are outputs/accomplishments of each task?	Minimum Criteria?	Can the performer do it without training?

(FEA, PLANNING)

WORKSHEET 2: PLANNING S/K SUPPORT

A. JOB AID VS INSTRUCTION											
Tasks That Need S/K Support	Maximum Time Allowed	Frequency	Amount	Complexity	Conse-quency of Error	Change Proba-bility	Psycho-social Factor	Other Factors	DECISION?		NOTES
									Aid	Instructions	

B. Who will develop the job aids? ____

____

____

C. Who will develop the instruction? ____________________________________

____

____

D. Is there instruction/job aids that currently exist that could be used or modified for any of the tasks?

☐ No.

☐ Yes. Explain: ____

____

____

____

____

E. What are the alternatives for delivery of the instruction to the performer?

F. Considering COSTS/EFFECTIVENESS/TIME, which alternative do you select?

(FEA, PLANNING)

WORKSHEET 3: PLANNING THE ENVIRONMENTAL SUPPORT

NOTE: Use the listing of the performance tasks from Worksheet 1, Item F as the basis for this work

A. Can any of the tasks be eliminated without penalty to the purposes of the work?

☐ No. ☐ Perhaps these: ______________________________

____

B. Have detailed performance methods for the tasks been described?

☐ Yes. Where? ______________________________

☐ No. Who should do it? ______________________________

____

C. Is there a reasonable possibility that any of the tasks can be simplified in number and complexity of steps?

☐ No.

☐ Yes. Which and how? ______________________________

____

____

____

D.

TASK NUMBER	INPUTS NEEDED TO PERFORM	TOOLS/EQUIPMENT NEEDED	WHAT IS DONE WITH THE OUTPUTS?

E. Is there a reasonable possibility that some of the tasks should be performed by someone other than the job you've specified?

☐ No.

☐ Yes. Which tasks for which other jobs: ____________________

F. What are the sources of information and aid for the performer doing the new tasks?

☐ None required.

☐ These: ____________________

G. Will the requirement to perform the tasks necessitate the need to add manpower?

☐ No.

☐ Yes. Estimates: ____________________

H. Are there any policy decisions that need to be made concerning the new tasks?

☐ No. ☐ Yes. ____________________

I. Other environmental factors that should be planned that will help support performance of the new tasks:

____

WORKSHEET 4: PLANNING MOTIVATIONAL-INCENTIVE-ATTITUDE SUPPORT

NOTE. Use Worksheet 1, Item F task list as the basis for this work . . .

A. Potential barriers to INITIAL motivation.			
Do any of these barriers to initial motivation exist for the performance of the tasks?	YES	NO	General notes and plans for overcoming the barriers or minimizing their effects:
1. Low confidence level in ability to perform.			
2. Don't know the rationale for the performance.			
3. Don't know the value of the outputs produced.			
4. Come with misinformation about the tasks.			
5. Tasks are socially negative.			
6. Performer unaware of the standards and criteria.			
7. Performance of the tasks themselves are intrinsically punishing.			
8. Opportunity to perform the tasks too long from the training in the task.			
9. Initial attempts at performance of the task punished by supervisor.			
10. Supervisors poor models for the performance of the task.			
11. Access to information, data, tools, and equipment difficult.			
12. Uncomfortable working environment.			
13. Other barriers to initial motivation:			

B. Potential BARRIERS to SUSTAINED motivation.			
Do any of these barriers to motivation-over-time exist?			General notes and plans for overcoming the barriers or minimizing their effects:
	YES	NO	
1. Performers will not get appropriate feedback on their performance.			
2. Tasks will be boring and/or repetitive.			
3. Appropriate performance will be "punished" by peers.			
4. Appropriate performance will be punished by supervisors.			
5. Effort to perform the tasks will exceed the rewards.			
6. Performer will not have sufficient access to data and information.			
7. Tools/equipment will be inadequate.			
8. Scope of decision making will be limited.			
9. Performer will not be given recognition for efforts.			
10. Performer will get conflicting directions.			
11. Other potential, probable barriers to sustained motivation:			

(FEA, PLANNING)

WORKSHEET 5: ACTION PLAN FOR PERFORMANCE SUPPORT

A. Reviewing Worksheet 2, these actions must be taken re <u>training</u> support:
B. Reviewing Worksheet 3, these actions must be taken re <u>environmental</u> support:
C. Reviewing Worksheet 4, these actions must be taken re <u>motivational</u> support:

D. Reviewing Items A, B, and C:		
These ACTIONS should occur in this SEQUENCE:	Action taken by:	And completed by this date:

MAJOR INITIATIVES OF INTEREST

<u>ON-GOING</u>

- BSEP WCA

<u>PLANNED</u>

- IN-TRAINING ACTUARIAL STUDENT PREDICTION

COMPLETION OF WCA FOR BSEP

- o LETTERS: 10 SCHOOLS - 36 MOS
- o RATIONALE: ADDITIONAL MOS/REVISED SMs
- o TOTAL WFA/WCA CYCLE: 4-6 MONTHS

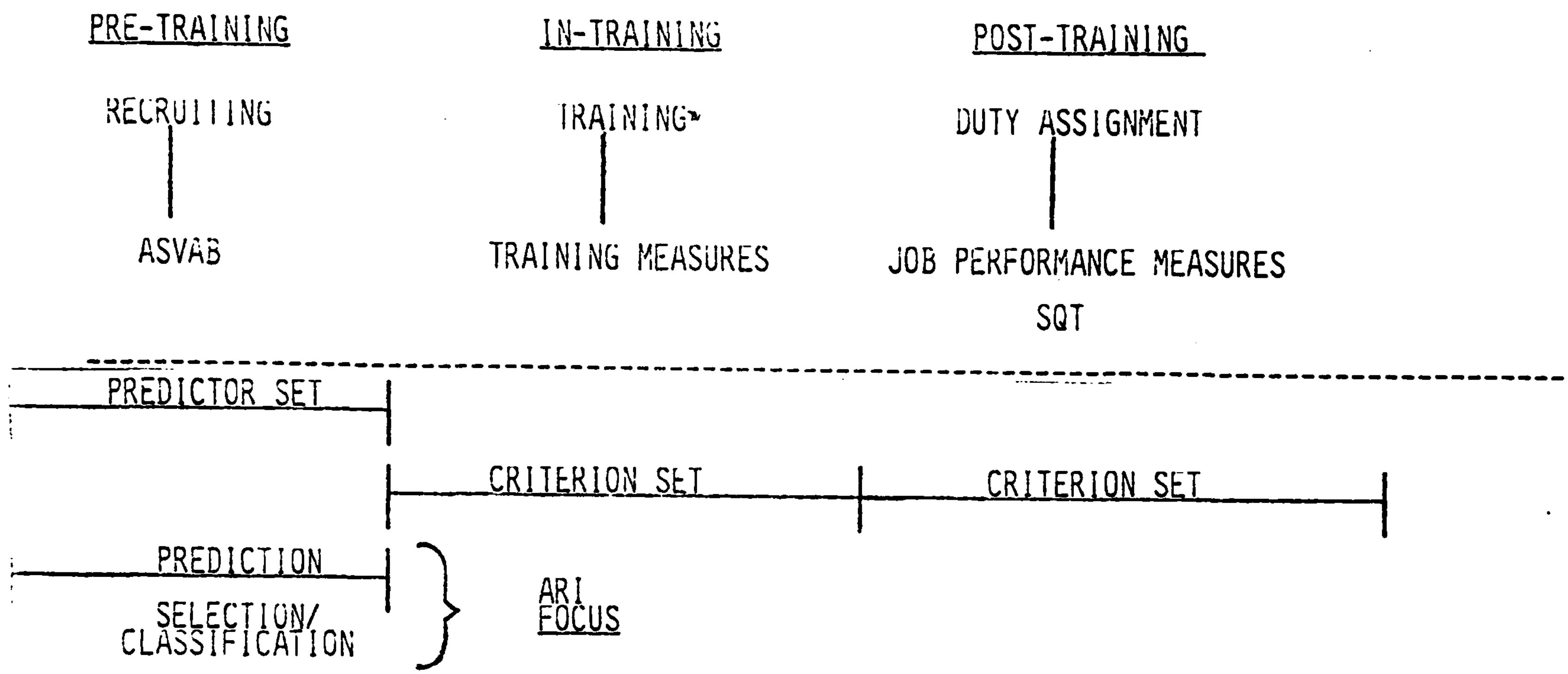
<u>NOTE</u>: SCHOOL WC ANALYST(S) SHOULD BE EXPERT(S) IN SM VOCABULARY.

IN-TRAINING ACTUARIAL STUDENT PREDICTION

- o SELECTION/CLASSIFICATION vs ISD
  - o WHATEVER HAPPENED TO SELECTION/CLASSIFICATION?
    - o 15 YEARS AGO = S/C
    - o PAST 15 YEARS = ISD
  - o EXPLOSION OF TRAINING TECHNIQUES/TECHNOLOGY
    - PI
    - CAI/CMI
    - S-P
    - CRI
    - ISD
    - A-Z
    - o ASSPT: S, R, RF → CONTROL/MODIFICATION OF BEHAVIOR
    - o COROLLARY: BLOOM'S MASTERY THEORY OF LEARNING
    - o MIXED TRACK RECORD
  - o ERGO: NEED TO RESTORE BALANCE: S/C & ISD

<u>THRUST</u>: S/C & ISD COMPLEMENT NOT REPLACE EACH OTHER.

o CLASSICAL PRE-TRAINING PREDICTION PARADIGM



o EXTENDED IN-TRAINING PREDICTION PARADIGM

PRE-TRAINING	IN-TRAINING	POST-TRAINING
RECRUITING	ISD	DUTY ASSIGNMENT
BIOGRAPHICAL DATA	CRITICAL TASK LIST	JOB PERFORMANCE MEASURE
ASVAB	SKILLS/KNOWLEDGES	SQT
	JPM	
	TRAINING MEASURES	

PREDICTOR SET

CRITERION SET

CRITERION SET

PREDICTION
REMEDIATION
SELECTION
COURSE DESIGN

TRADOC
FOCUS

o UTILITY ANALOGY

<u>LIFE INSURANCE</u>*

MEDICAL FACTORS
AGE GROUP

ACTUARIAL LIFE
RISK TABLE

GRANTED-DENIED

<u>TRAINING SUCCESS</u>**

BIOGRAPHICAL FACTORS
APTITUDE/ACHIEVEMENTS GROUP

ACTUARIAL TRAINING
SUCCESS/RISK TABLE

GO-NO GO

---

* PROFITS: IN THE "BILLIONS"

** PAYOFF: REDUCED WASTE OF TRAINING
IMPROVED COURSE DESIGN

TDI INITIATIVES ON AOSP/CODAP

- TRADOC SUPPLEMENT TO AR 611-3 (REVISION)
- TRAINING MODULE TO J/1A WORKSHOP (REVISION)

TRADOC SUPPLEMENT TO AR 611-3 (REVISION

- o PROBLEM

  LACK OF CLARITY IN RESPONSIBILITIES AND ADMINISTRATION PROCEDURES EXISTS BETWEEN COMMANDS/WITHIN SCHOOLS ON AOSP/CODAP MATTERS.

- o NEEDS
  - o PUBLISH TRADOC SUPPLEMENT TO BASIC AR 611-3
    - o SCOPE
    - o RESPONSIBILITIES (HQ/SCHOOLS)
    - o MANAGEMENT FUNCTIONS
    - o AOSP-POCS NETWORK/DESIGNATION
    - o PROCEDURES/SCENARIO/MILESTONES
    - o TRAINING FACTOR QUESTIONNAIRE
  - o REVISE THE SUPPLEMENT
  - o ACQUIRE, DISSEMINATE, USE

TRAINING MODULES FOR J/TA WORKSHOP

- o PROBLEM
  - o CURRENT MODULE DOES NOT:
    - o ADDRESS ALL USER LEVELS
    - o REFLECT LATEST REVISION OF CODAP INFORMATION/USER GUIDE
- o NEEDS
  - o A MODULE WHICH:
    - o REFLECTS LATEST AOSP/CODAP POLICY
    - o PROVIDES INFORMATION/USER GUIDANCE FOR OTHER COMMAND LEVELS: E.G., SENIOR MANAGERS, PRIMARY AOSP-POC AND SECONDARY AOSP-POC.
  - o INSURE DISSEMINATION TO ALL WHO NEED TO KNOW.

AOSP: Coordination/Actions

Services, Products & By-Products

- o Role/Proponency (AOSP/CODAP)
  - o SSC-NCR:
    - o Proponent for: AOSP/CODAP
    - o Proponent for: AR 611-3; DA Pam 611-3; AOSP-CODAP User Guide
  - o HQ TRADOC:
    - o Ombudsman
    - o Proponent for: TR Suppl AR 611-3; J/TA Workshop Module
- o Coordination/Actions (SSC-NCR/TDI)
  - o Dissemination of monthly MOS/specialty survey status report to schools
  - o Establishment of POC (SSC-NCR) for direct assistance to schools
  - o Requesting TAGCEN to permit 1st class mail
  - o Requesting SSC to authorize word processing equipment
  - o Insure school review/coordination of final survey draft
  - o Include training emphasis on all surveys
  - o Include learning difficulty on all surveys (If sufficient E6's/E7's available)
  - o Will phase in frequency data (on demand)
  - o 84 PAAR submission:
    - o SSC-NCR Computer
    - o Increased Staff
      (Action Level: MG French to General Otis)
  - o Survey needs analysis for schools (On school request)
  - o Revision of AR 611-3/DA Pam 611-3 (Planning)
  - o Revision of AOSP/CODAP User Guide (Started)
  - o Revision of TR Suppl AR 611-3 (Started)
  - o Revision of TRADOC J/TA training module (Planning)

FEA FOR NEW SYSTEMS

- HARDMAN
- ETES

DRC

SESSION OVERVIEW

TIME	TOPIC	SPEAKER
8:00 – 8:20	INTRODUCTION TO FEA FOR NEW SYSTEMS	TOM MANNLE
8:20 – 9:00	ARMY HARDMAN PROJECT	TOM MANNLE
9:00 – 9:50	HARDMAN TRRA	LARRY O'BRIEN
9:50 – 10:20	BREAK	—
10:20 – 11:30	ETES	LARRY O'BRIEN

DEFINING FEA

DEFINITION	DESCRIPTION	DEFINING FACTOR
FEA FOR ISD	INITIAL ANALYSIS FOR ISD, REGARDLESS OF ACQUISITION PROCESS	LOCATION IN ISD PROCESS
FEA FOR ACQUISITION	ANALYSIS OF MPT DURING EARLY PHASES OF WSAP	LOCATION IN ACQUISITION PROCESS

DRC

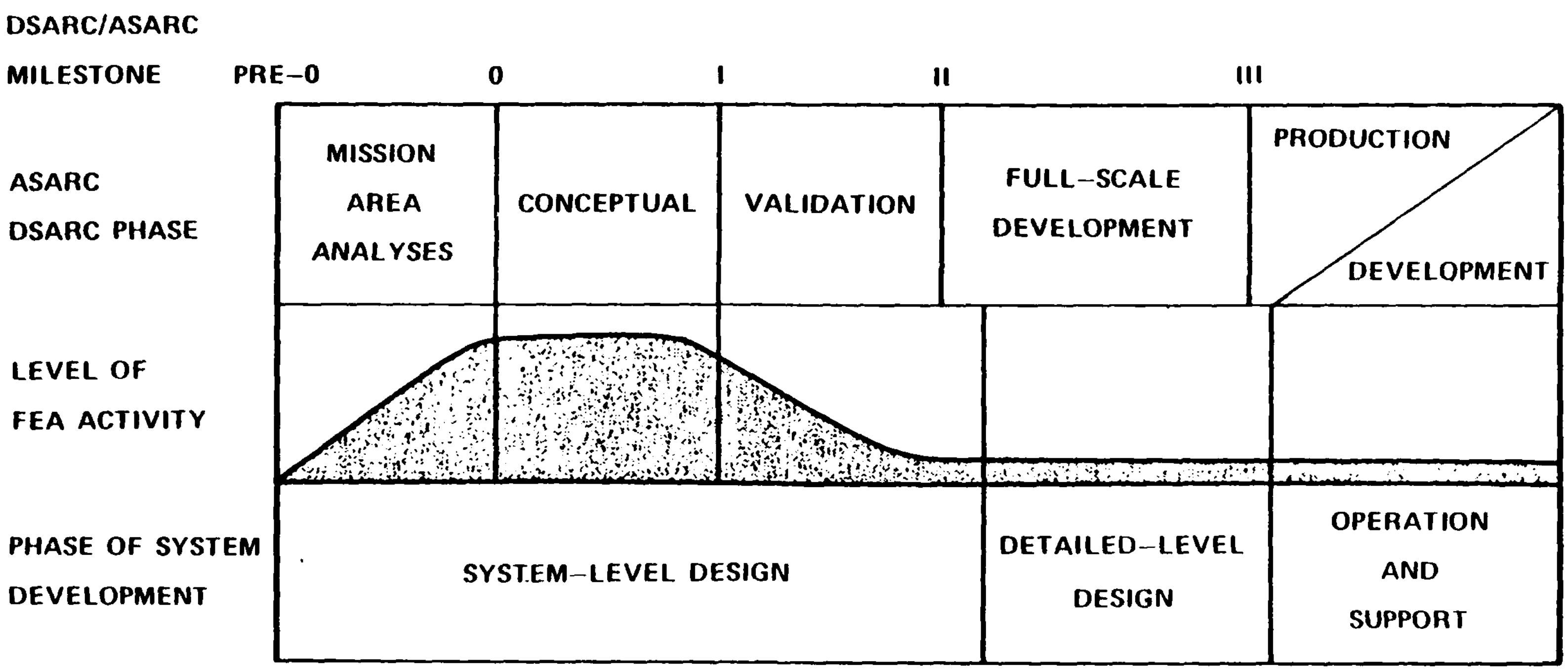
FEA DEFINED

FRONT-END ANALYSIS (FEA) IS A PROCESS THAT EVALUATES REQUIREMENTS FOR SUPPORT ELEMENTS DURING THE EARLY STAGES OF THE MILITARY SYSTEMS ACQUISITION CYCLE. ITS PURPOSE IS TO (1) DETERMINE LOGISTICS SUPPORT REQUIREMENTS UNDER ALTERNATIVE SYSTEM CONCEPTS AND DESIGNS, AND (2) ESTIMATE THE IMPACT OF THESE REQUIREMENTS ON SYSTEM EFFECTIVENESS AND LIFE-CYCLE COSTS. ITS END-PRODUCT SHOULD BE THE INFORMATION NEEDED TO ASSUME THAT EFFECTIVE SUPPORT RESOURCES (HUMAN, EQUIPMENT, MATERIEL) WILL BE AVAILABLE WHEN AND AS REQUIRED FOR EACH SYSTEM TO ACHIEVE ITS INTENDED CONTRIBUTION TO MILITARY READINESS AND EFFECTIVENESS.

FROM: SEIDEL, R., AND WAGNER, H. FRONT-END ANALYSIS TO AID EMERGING TRAINING SYSTEMS. HUMMRO REPORT SR-ETSD-80-3, FEBRUARY, 1980.

DRC

WEAPON SYSTEM ACQUISITION PROCESS AND FE



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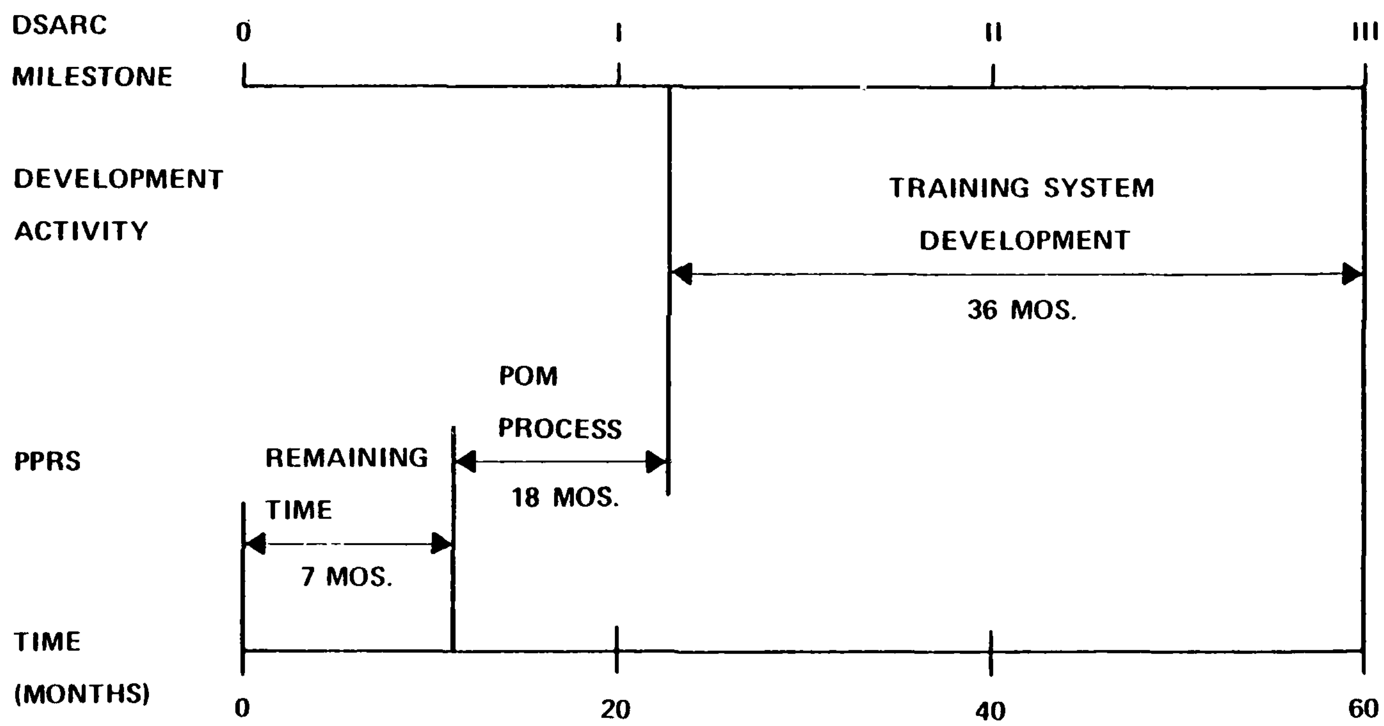
WHY FRONT-END ANALYSIS ?

-PLAN FOR DEVELOPMENT OF TRAINING PRODUCTS

-INFLUENCE DESIGN OF NEW SYSTEM

NEED FOR PLANNING



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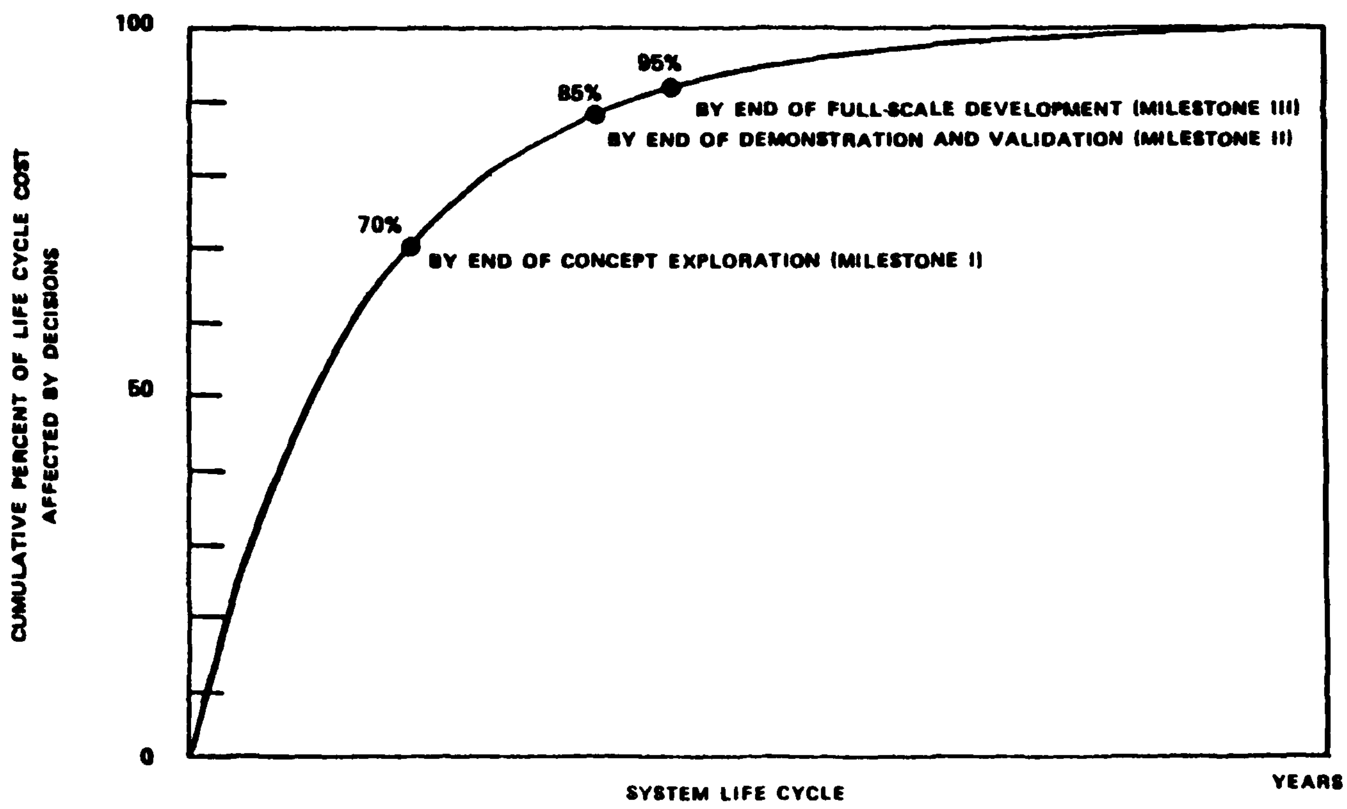
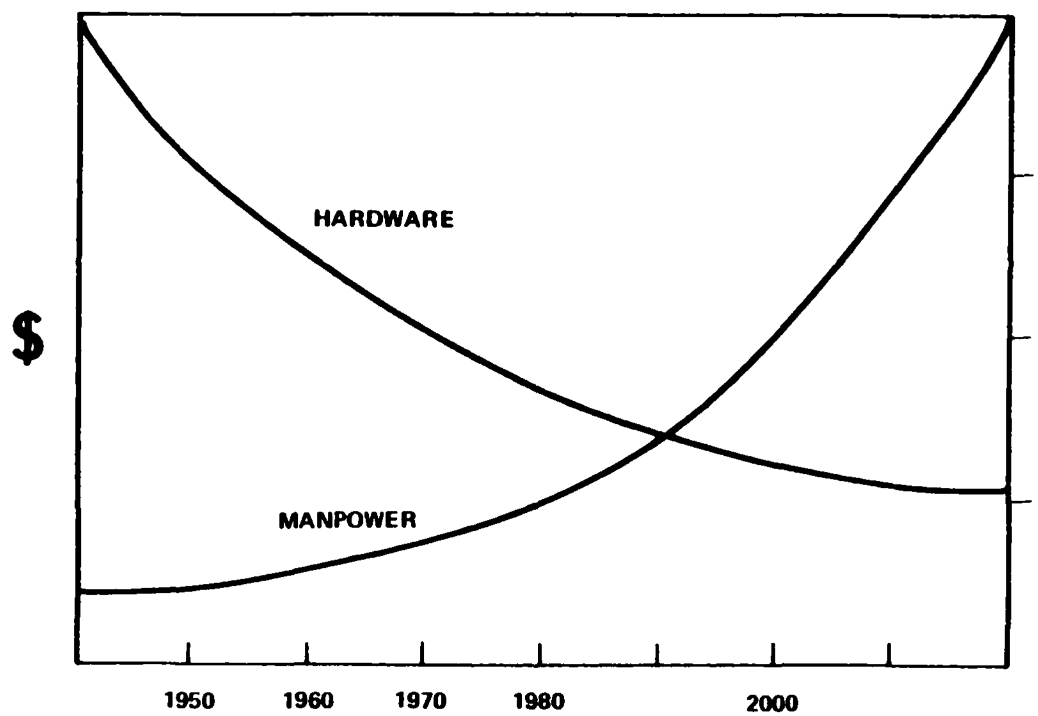
WHY FRONT-END ANALYSIS?



SOURCE: Proceedings from National Security Industrial Association Symposium on Navy Systems Acquisition, October 27-28, 1977.

RELATIVE COSTS IN TODAYS DOLLARS



SOURCE: PROCEEDINGS, NATIONAL SECURITY INDUSTRIAL ASSOCIATION, FIRST ANNUAL CONFERENCE' MAY 1981, SAN DIEGO

WHAT HAPPENS WITHOUT FEA ?

MANPOWER , PERSONNEL, AND TRAINING PROBLEMS

- DD 963
- F-15 ATE
- AN/SPG-55B

FROM:GAO REPORT, OCTOBER 1980

QUOTE WITHOUT COMMENT

THE LACK OF ADEQUATE FRONT-END LOGISTICS SUPPORT PLANNING AND THE FAILURE TO DEDICATE SUFFICIENT PROGRAM RESOURCES IN A TIMELY MANNER TO DEVELOPING AND REVIEWING LOGISTICS SUPPORT CAPABILITY HAVE ADVERSELY AFFECTED THE *DEVELOPMENT* OF M1 TEST EQUIPMENT AND TECHNICAL MANUALS.

FROM: LOGISTICS PLANNING FOR THE M1 TANK: IMPLICATIONS FOR REDUCED READINESS AND INCREASED SUPPORT COSTS
GAO REPORT PLRD-81-33, JULY 1, 1981.

DRC

SOUNDS NICE, BUT...

–MUST DO FEA ANYWAY, TO PLAN FOR TRAINING PRODUCTS

–INFLUENCING DESIGN IS, OR WILL BECOME, AN IMPORTANT PART OF ARMY POLICY

–FEA TECHNOLOGIES ARE OR WILL SOON BE AVAILABLE

DRC

DOD/ARMY REQUIREMENTS FOR FEA

DOD

DoDD 5000.1
DoDD 5000.2
DoDD 5000.3
DoDD 5000.39
DoDD 5000.40
MIL-STD 1388
MIL-M-63035
MIL-M-63040
MIL-STD-XXXX (TASK ANALYSIS)

ARMY

DA PAM 11-25
AR 702-2
AR 700-127
DARCOM PAM 750-16
TRADOC REG 351-4
TRADOC REG 700-1
TRADOC PAM 71-10
TRADOC PAM 310-8
TRADOC PAM 350-30
TRADOC PAM 351-6
TRADOC CIR 70-1
TRADOC CIR 350-7 (DRAFT)
TRADOC CIR 351-3
TRADOC CIR 351-7
TRADOC CIR 351-8
TRADOC CIR 351-28
TM 38-710
FM 770-78

DRC

DEPARTMENT OF DEFENSE DIRECTIVE 5000.39

- VISIBILITY TO "MANPOWER PLANNING"
- CALLS FOR
  - COMPARABILITY ANALYSIS TO TARGET HIGH DRIVERS
  - "A CONTEMPORARY BASELINE SYSTEM"
  - AN "AUDIT TRAIL"
  - FRONT-END ANALYSIS
- REQUIRES TRADEOFFS AMONG SYSTEM CHARACTERISTICS, MANPOWER AND SUPPORT CONCEPTS

DRC

TRAINING PLANNING AND ANALYSIS PRODUCTS DURING ASARC PHASES I and II

- OICTP/ICTP
- CTEA
- LSA
- NETP
- TDR
- PQQPRI/QQPRI
- SPA

POTENTIAL PROBLEMS FOR FEA

- MAY REQUIRE REDEFINITION OF ROLES, DUTIES, ETC., PLAYED BY VARIOUS ORGANIZATIONS
- INCENTIVES TO MAKE IT WORK MAY BE INSUFFICIENT
- ALLOCATION OF RESOURCES FOR FEA LAG BEHIND NEED
- DATA BASES ARE NOT SYSTEMATICALLY ORGANIZED FOR FEA
- EXISTING PROCEDURES AND TECHNIQUES ARE NOT GEARED FOR EARLY PHASES

DRC

SUMMARY

FEA

-THE NEED IS THERE

-SOME POTENTIAL ORGANIZATIONAL AND TECHNICAL PROBLEMS

-HOW DO WE DO IT?

ARMY HARDMAN PROJECT

THOMAS MANNLE

OVERVIEW

-HISTORY AND MAJOR CONCEPTS

-OVERVIEW OF STEPS

-ESPAWS RESULTS

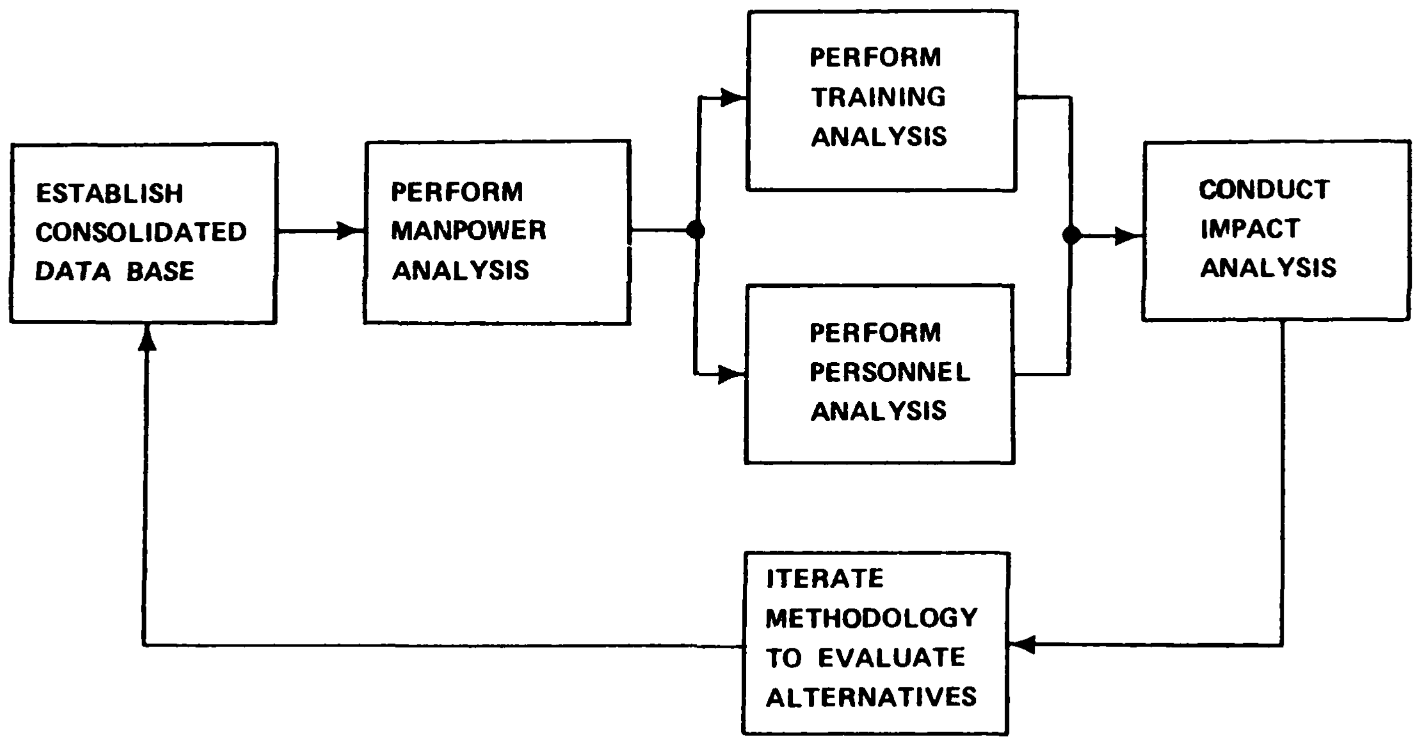
DRC

PURPOSE OF THE HARDMAN STUDY

- INSURE EXPLICIT CONSIDERATION OF MANPOWER/TRAINING RESOURCE REQUIREMENTS EARLY IN THE WEAPON SYSTEM ACQUISITION PROCESS

DRC

STEPS IN METHODOLOGY



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ELEMENTS OF THE METHODOLOGY

- METHODOLOGY
  - CONSOLIDATED DATA BASE
    - OPERATION/SUPPORT SPECIFICATIONS
    - R&M DATA
    - TRAINING DATA
    - PERSONNEL DATA
    - COST DATA
  - ANALYTIC TECHNIQUES
    - RESOURCE REQUIREMENTS ANALYSIS
    - PERSONNEL ANALYSIS
    - TRAINING ANALYSIS
    - IMPACT ANALYSIS
    - TRADE–OFF STUDIES
  - SYSTEMATIC PROCEDURES
    - ESTABLISH/UPDATE BASELINE
    - MAINTAIN AUDIT TRAIL
    - IDENTIFY HIGH DRIVERS
    - SUPPORT DETAILED ILS PLANNING
    - EVALUATE POST PRODUCTION MODIFICATIONS

DRC

COMPARABILITY ANALYSIS DEFINED

". . . IDENTIFY A COMPARABLE PIECE OF EQUIPMENT THAT IS ALREADY IN USE FOR A SIMILAR PURPOSE IN A SIMILAR PHYSICAL AND OPERATIONAL ENVIRONMENT, AND USE FIELD EXPERIENCE ON IT AS A BASELINE FOR PREDICTING MAINTENANCE FREQUENCY ON THE NEW EQUIPMENT . . .
THE OBJECTIVE OF COMPARABILITY ANALYSIS IS TO ESTABLISH THE RATE AT WHICH CORRECTIVE MAINTENANCE WILL BE DONE, ANALOGOUS TO FAILURE RATE."

LTC Donald C. Tetmeyer
May 1976

BENEFITS OF COMPARABILITY ANALYSIS

- EMPIRICAL
- MIRRORS COGNITIVE PROCESSES OF DESIGNERS
- ALLOWS EARLY SPECIFICATION IN SIGNIFICANT DETAIL
- PLACES MINIMUM DATA REQUIREMENTS ON HARDWARE DEVELOPER

COMPARABILITY ANALYSIS DEFINED

". . . IDENTIFY A COMPARABLE PIECE OF EQUIPMENT THAT IS ALREADY IN USE FOR A SIMILAR PURPOSE IN A SIMILAR PHYSICAL AND OPERATIONAL ENVIRONMENT, AND USE FIELD EXPERIENCE ON IT AS A BASELINE FOR PREDICTING MAINTENANCE FREQUENCY ON THE NEW EQUIPMENT . . . THE OBJECTIVE OF COMPARABILITY ANALYSIS IS TO ESTABLISH THE RATE AT WHICH CORRECTIVE MAINTENANCE WILL BE DONE, ANALOGOUS TO FAILURE RATE."

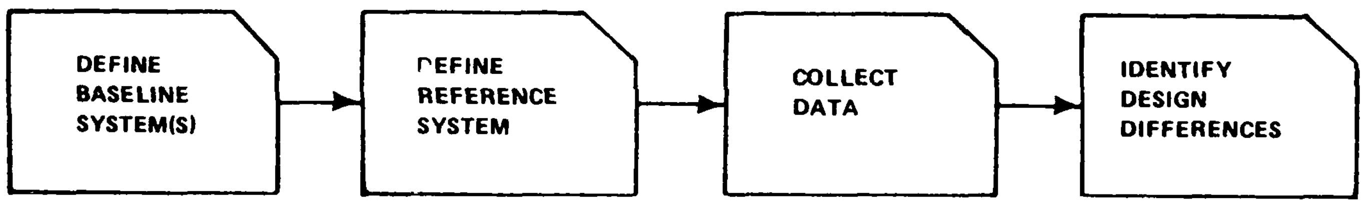
LTC Donald C. Tetmeyer
May 1976

DRC

BENEFITS OF COMPARABILITY ANALYSIS

- EMPIRICAL
- MIRRORS COGNITIVE PROCESSES OF DESIGNERS
- ALLOWS EARLY SPECIFICATION IN SIGNIFICANT DETAIL
- PLACES MINIMUM DATA REQUIREMENTS ON HARDWARE DEVELOPER

THE BASIC APPROACH



Define Baseline System(s)

- o Mission Area Analysis
- o Technology Base Studies
- o Contractor Studies/Proposals

Define Reference System

- o Mission Area Analysis
- o DOD/NATO Inventory

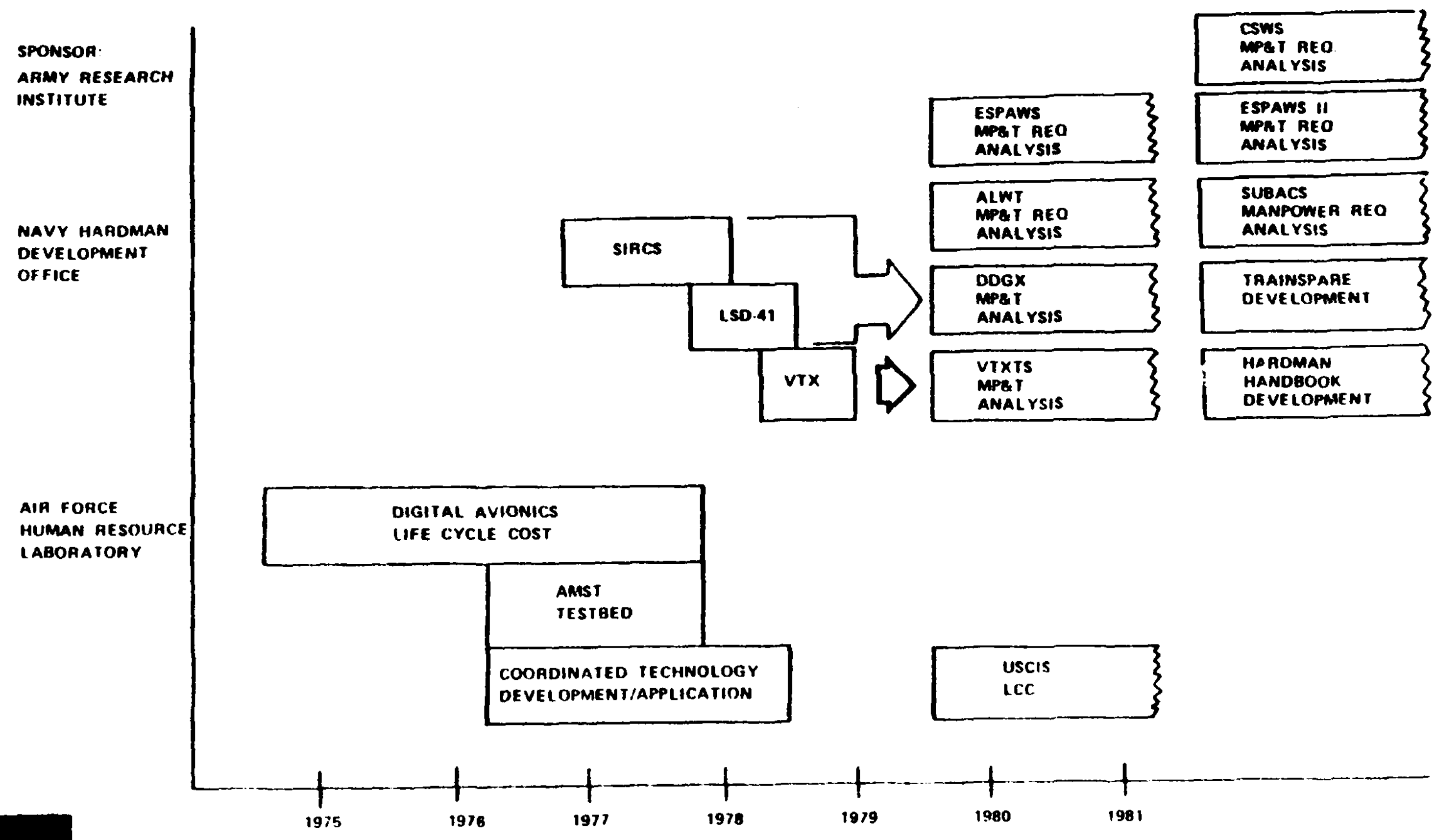
Collect Data

- o Navy: 3M
- o AF: 66-1
- o Army: SDC
- o Operator/Crew

Identify Design Differences

- o Δ = B–R
- o "high drivers"

DEVELOPMENT OF METHODOLOGY



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THE ENHANCED SELF-PROPELLED ARTILLERY WEAPON SYSTEM (ESPAWS)

- MISSION AREA PROFILE
  - FIELD ARTILLERY TASKS: TARGET SERVICING, COUNTERFIRE, INTERDICTION
  - 1985–1995 TIME FRAME
  - 24 HOUR CONTINUOUS ENGAGEMENT

- NEW/IMPROVED CAPABILITIES
  - REDUCE VULNERABILITY THROUGH AUTONOMOUS OPERATION
    - POSITION LOCATION/ORIENTATION
    - COMMUNICATIONS
    - FIRE CONTROL PROCESSOR
  - INCREASED RESPONSIVENESS AND VOLUME OF FIRES
    - AUTOMATIC AMMUNITION LOADER

- PROGRAM STATUS
  - PRE-MENS/MENS APPROVED DECEMBER 1980
  - ALTERNATIVE CONCEPT EXPLORATION:
    NORDEN SYSTEMS, INC.
    PACIFIC CAR AND FOUNDRY COMPANY
    FMC CORPORATION

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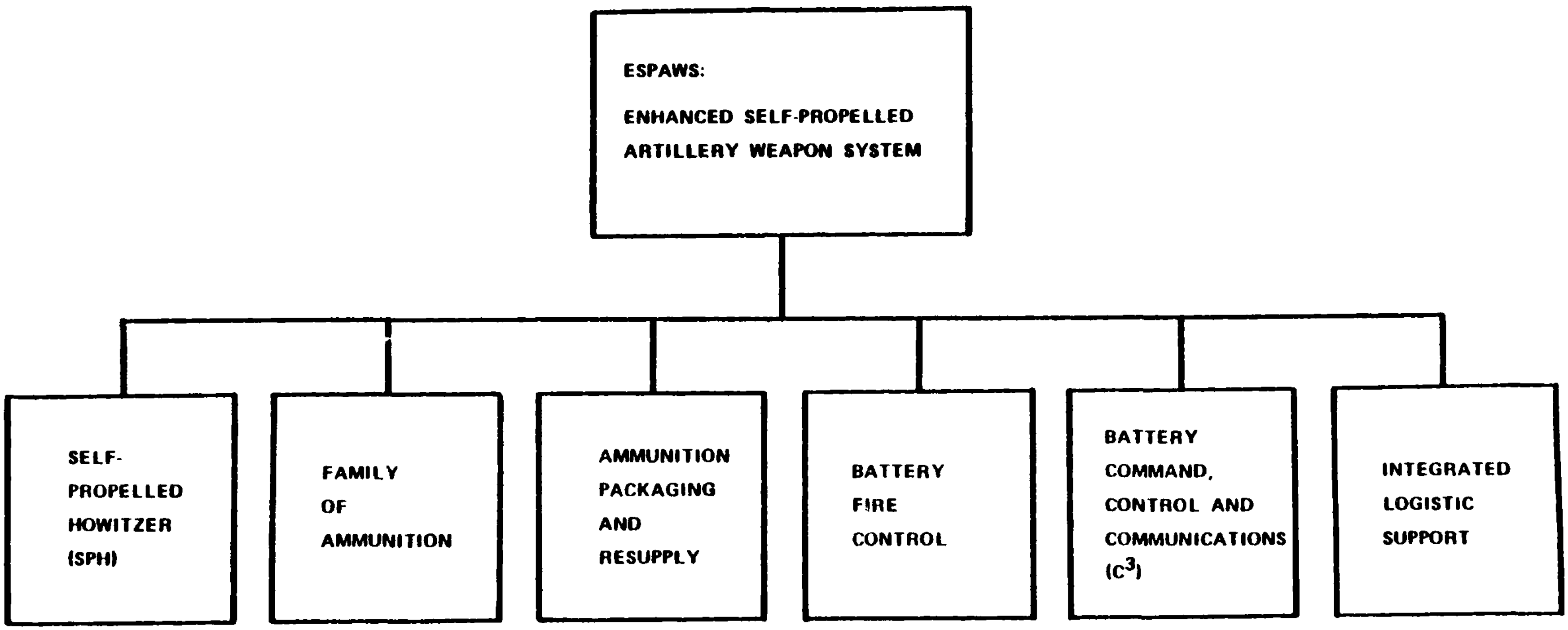
ESPAWS SYSTEM CONCEPT



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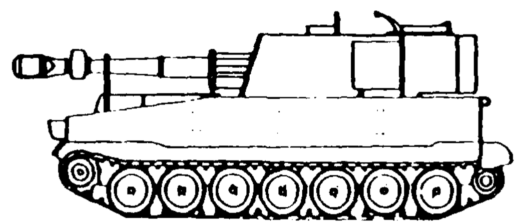
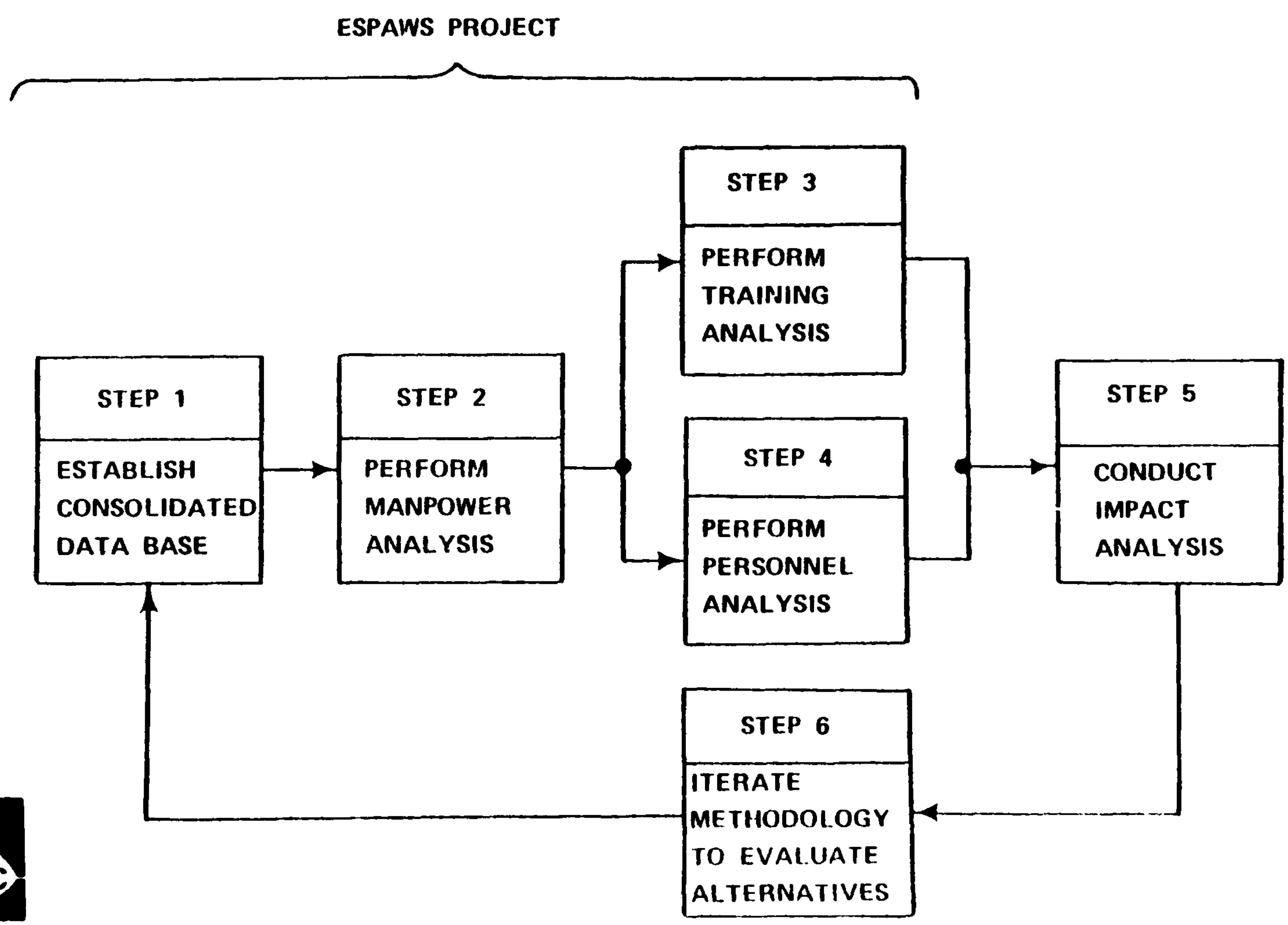
ARI/DRC ESPAWS PROJECT

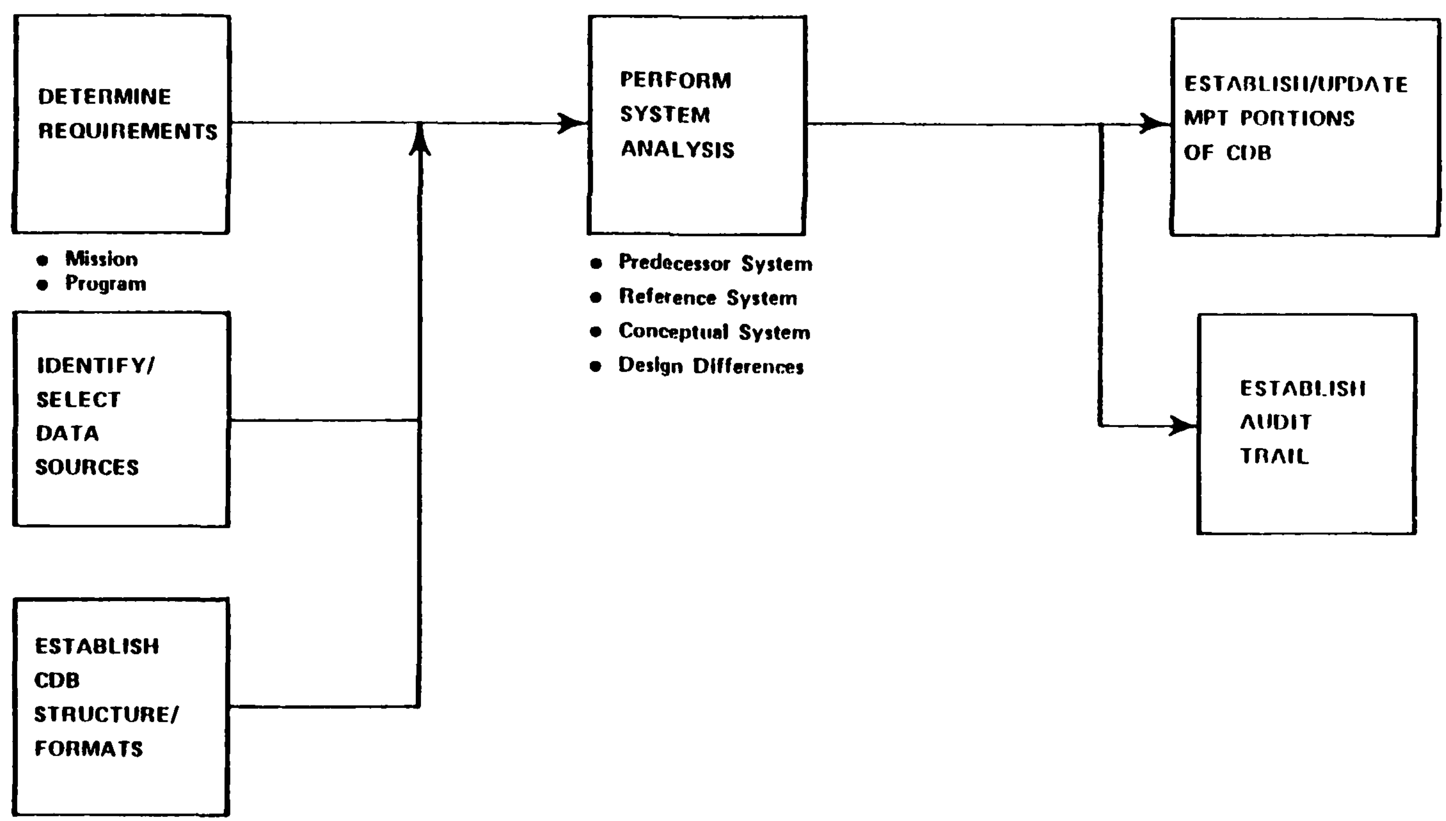
- SIX MONTH STUDY EFFORT
- DETERMINE MANPOWER, PERSONNEL AND TRAINING REQUIREMENTS AND COST FOR THE SELF-PROPELLED HOWITZER
  - CREW LEVEL
  - ORGANIZATIONAL LEVEL
- GOALS:
  - TO ESTABLISH THE CAPABILITY OF THE METHODOLOGY'S ANALYTIC TOOLS AND DATA MANAGEMENT TECHNIQUES IN THE ARMY SYSTEM DEVELOPMENT PROCESS
  - TO DETERMINE THE AVAILABILITY OF REQUIRED DATA AND ITS QUALITY
  - TO TEST THE FEASIBILITY OF PUSHING FRONT-END ANALYTICAL TOOLS INTO THE MISSION AREA ANALYSIS PHASE
  - TO PROVIDE RIGOROUS, WELL DOCUMENTED SUPPORTABILITY ASSESSMENTS FOR ESPAWS



STEPS IN METHODOLOGY



STEP 1
ESTABLISH CONSOLIDATED DATA BASE



1.4.1 ANALYZE SYSTEM FUNCTIONAL REQUIREMENTS

HARDMAN SYSTEM DEFINITIONS

	SATISFIES SYSTEM FUNCTIONAL REQUIREMENTS?				
	WHAT	HOW WELL	TECHNOLOGY	STATUS	DATA
PREDECESSOR	MAJORITY	MANY DEFICIENCIES	EXISTING–OUTDATED/OBSOLETE	DEPLOYED/OBSOLETE DoD/NATO	MATURE
REFERENCE	ALL	SOME DEFICIENCIES	CURRENT–STATE OF THE ART	DEPLOYED–DoD/NATO	MATURE
BASELINE	ALL	FEW DEFICIENCIES	FUTURE–EMERGING, LOW-RISK	IN DEVELOPMENT	IMMATURE • Engineering Estimates • OT/DT Test • Lab Test

ESPAWS EQUIPMENT COMPARABILITY ANALYSIS

DEFINE CONCEPTUAL SYSTEM → DEFINE REFERENCE SYSTEM → COLLECT DATA → IDENTIFY DESIGN DIFFERENCES

DEFINE CONCEPTUAL SYSTEM	DEFINE REFERENCE SYSTEM	COLLECT DATA	IDENTIFY DESIGN DIFFERENCES
• ESPAWS MAA/MENS	• M109A1 (Predecessor)	• SDC	• Land Navigation
• Technology Base Studies	• USN/USAF Equipments	• Mission Profile/ Operational Mode Summary	• Communications
• USA FAS	• Other Existing Equipment (VRC-12)	• ARI Howitzer Crew Model	• Fire Control Computer
• ARRADCOM			• Automatic Ammunition Loading
• Contractor Proposals			• Improved Automotives

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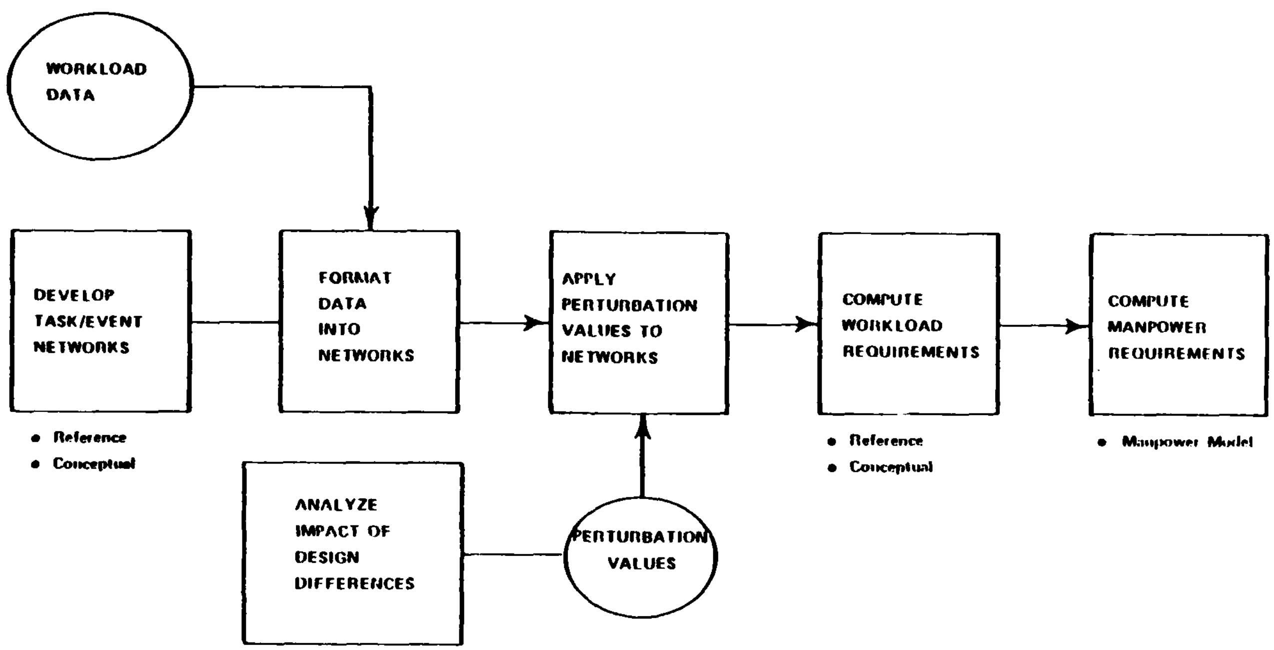
CONCEPTUAL SYSTEM DESIGN DIFFERENCES

GG No.	Change No.	System	Design Change
01	N01-1	ENGINE	1. OIL COOLING REDESIGN
	N01-2	ENGINE	2. STANDARD TEST EQUIPMENT/INTERNAL COMBUSTION ENGINE (STE/ICE)
03	N03-1	FUEL	1. WATERPROOF AIR CLEANER BLOWER
05	N05-1	COOLING	1. INCREASE CAPACITY
	N05-2		2. INCREASE RADIATOR SURFACE AREA
	N05-3		3. RELOCATE FAN
06	N06-1	ELECTRICAL	1. STARTER CUT-OFF SWITCH
	N06-2		2. IMPROVE VENTILATING BLOWER
	N06-3		3. IMPROVE NEUTRAL SAFETY SWITCH
	N06-4		4. REDESIGN/RELOCATE COMPONENTS
13	N13-1	TRACK AND SUSPENSION	1. REDESIGN ROAD WHEEL SEALS
19	N19-1	AHARS	1. KHS 2100
		FM RADIO	2. NO CHANGE
	N19-3	AMMUNITION AUTOLOADER	3. IMPROVED ELECTRONICS, BITE, MODULAR DESIGN
28	N28-1	FIRE CONTROL COMPUTER	1. AN/AYK-14

STEP 2
MANPOWER REQUIREMENTS ANALYSIS



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ESPAWS

ORGANIZATIONAL MAINTENANCE MANPOWER

MOS	Predecessor	Reference	Conceptual
13B (45D)	2	6	4
31V	–	29	2
41C	1	1	1
44B	1	1	1
45K	8	11	11
45L	3	5	5
63B	1	1	1
63C	3	4	4
TOTAL	19	58	29

STEP 3
TRAINING REQUIREMENTS ANALYSIS

ESTABLISH TRAINING PROGRAMS → DETERMINE TRAINING REQUIREMENTS

FOR REFERENCE AND CONCEPTUAL SYSTEMS:

- Analyze Task/Skill Requirements
  - Add/Eliminate/Modify Tasks
  - Identify MOS/Skill Level
- Determine Training Settings
- Analyze Course Impacts
  - Add/Eliminate/Modify Existing Courses
  - Develop New Courses
- Determine General Media Requirements

FOR PREDECESSOR, REFERENCE AND CONCEPTUAL SYSTEMS:

- Construct Training Paths
- Determine General Time–Phased Requirements
  - Replacement Personnel
  - Instructors
- Calculate Training Costs
  - Course Costs
  - Instructor Costs

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STEP 4
PERSONNEL REQUIREMENTS ANALYSIS

ESTABLISH PERSONNEL PIPELINE FLOW CHARACTERISTICS → DETERMINE PERSONNEL REQUIREMENTS

ESTABLISH PERSONNEL PIPELINE FLOW CHARACTERISTICS

- Current Pipeline Flow
  - Career Paths
  - Advance/Attrite Probabilities
  - Time in Paygrade
  - Duty Rotation
- Apply Modification Factors
- Format Reference and Conceptual Pipelines

DETERMINE PERSONNEL REQUIREMENTS

- Minimum Flow Solution Model
- Calculate Personnel Costs

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DEFINITION OF PERSONNEL REQUIREMENTS

PERSONNEL REQUIREMENTS = MANPOWER REQUIREMENTS + ATTRITION FACTOR + FACTORS TO ACCOUNT FOR OTHER LOSSES

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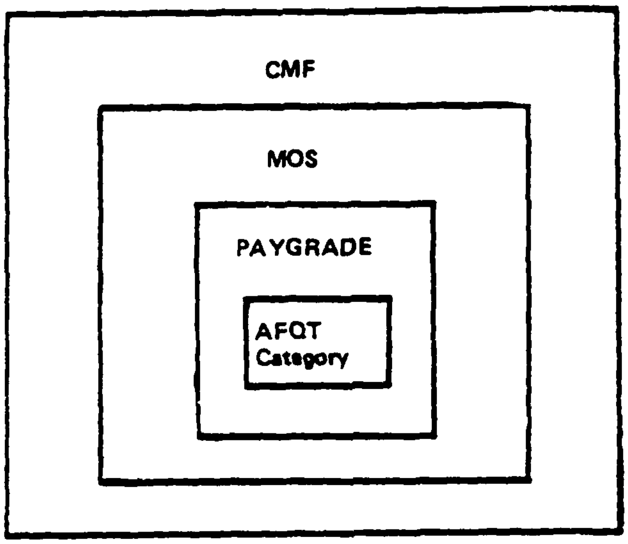
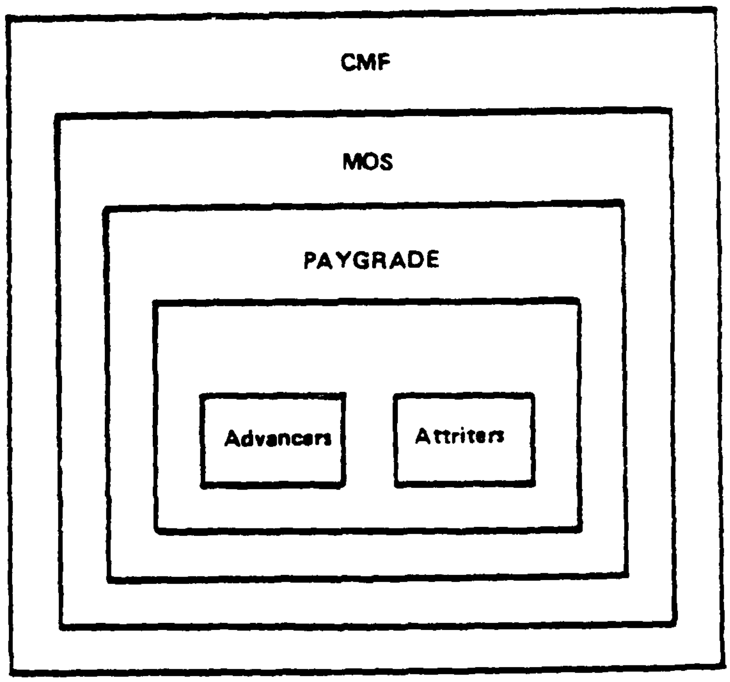
SUBGROUPS FOR PERSONNEL ANALYSIS

a. Advancement/Attrition Probability Subgroups



b. Average Time-in-Paygrade Subgroups

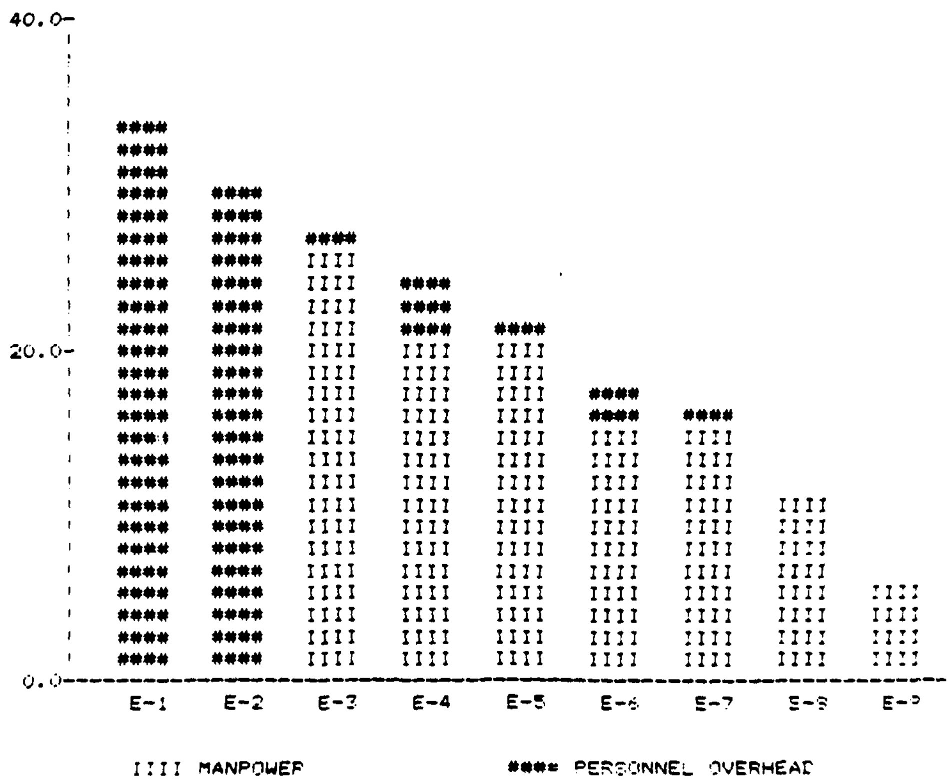


PERSONNEL REQUIREMENTS

MOS = XXX
MANPOWER REQUIREMENTS = 0, 0, 25, 20, 20, 15, 15, 10, 5

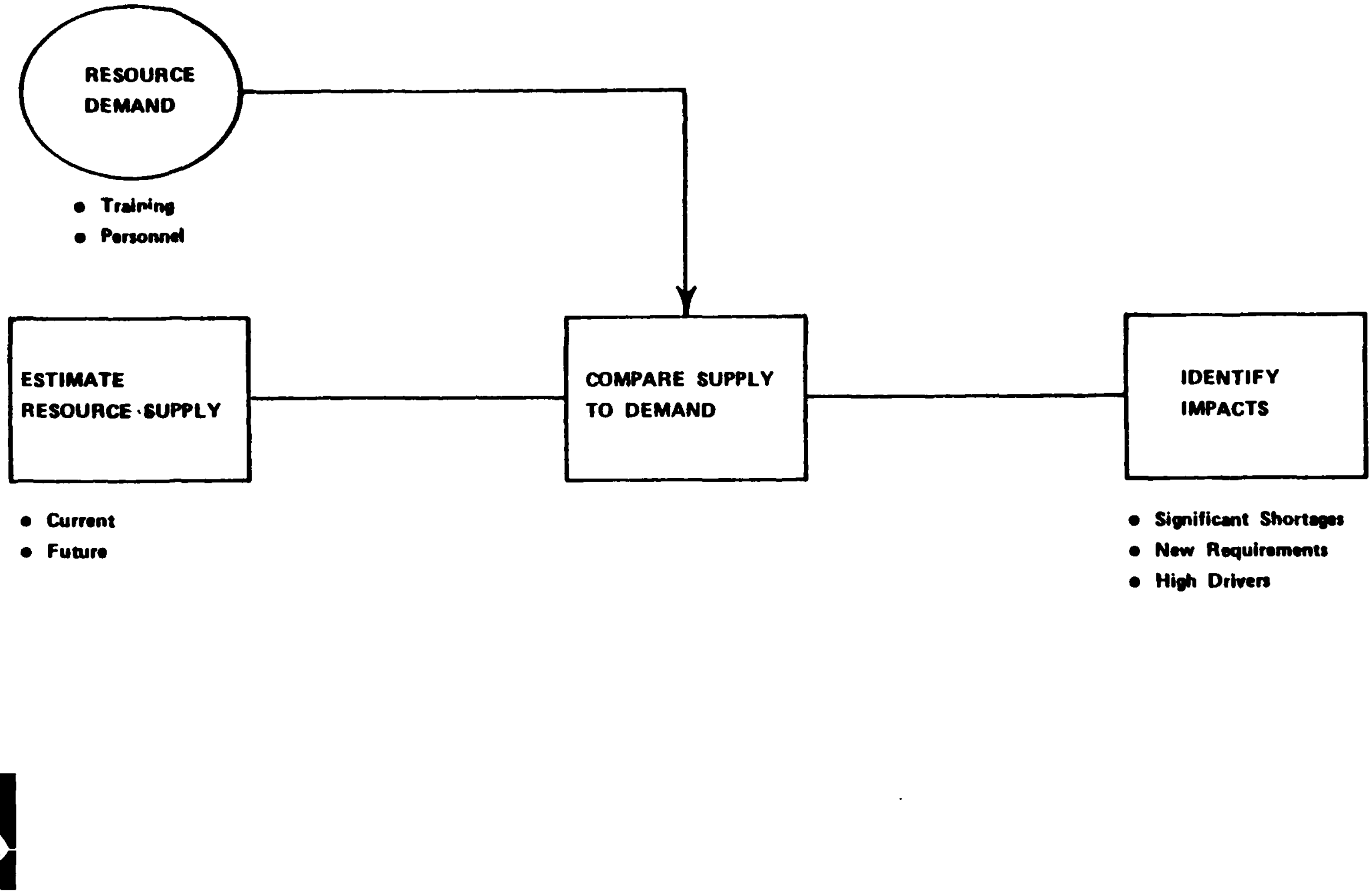
MOS = XXX

PG	MANPOWER	PERSONNEL
E-1	0	33.1
E-2	0	29.4
E-3	25	26.9
E-4	20	23.4
E-5	20	21.6
E-6	15	17.4
E-7	15	16.2
E-8	10	10.7
E-9	5	5.4

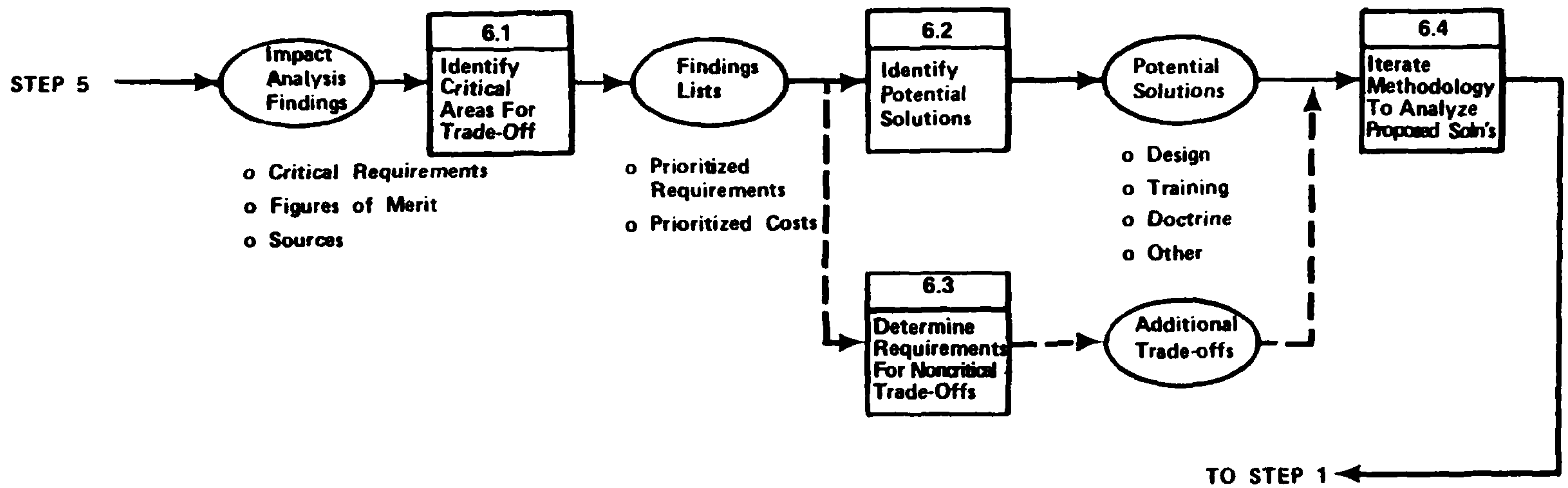


STEP 5

IMPACT ANALYSIS



STEP 6 PERFORM TRADEOFF ANALYSIS



BOTTOM LINE

ESPAWS PHASE 1

- HARDMAN METHODOLOGY SUCCESSFULLY DEMONSTRATED
  - VERY EARLY IN ARMY WSAP (MAA PHASE)
  - MAJOR GROUND WEAPON SYSTEM (ACAT I)
- HARDMAN METHODOLOGY FEASIBLE FOR ARMY SYSTEMS
  - SUFFICIENT DATA AVAILABLE
  - DATA QUALITY GOOD TO EXCELLENT
  - EXISTING ANALYTIC TOOLS SUCCESSFULLY MODIFIED; NEW TOOLS DEVELOPED
- QUALIFICATIONS – ADDRESSED IN PHASE II EFFORT
  - APPLIED TO ONE SYSTEM ONLY
  - REQUIREMENTS ONLY THROUGH ORGANIZATIONAL LEVEL

SUMMARY

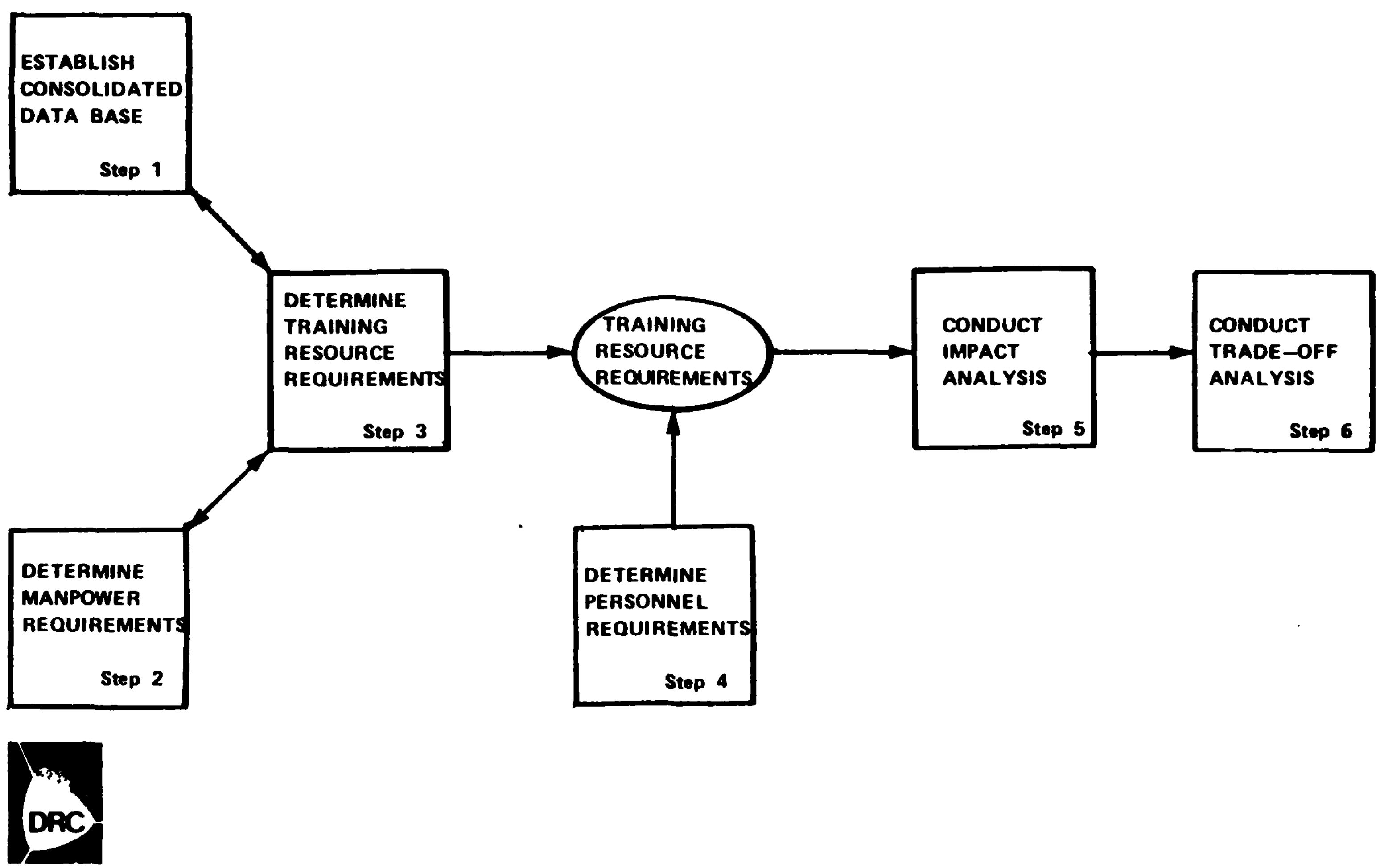
- THE METHODOLOGY HAS BEEN CONCEPTUALIZED TO DETERMINE MANPOWER, PERSONNEL AND TRAINING REQUIREMENTS DURING THE EARLY PHASES OF THE WEAPON SYSTEM ACQUISITION PROCESS
- THE METHODOLOGY IS FULLY RESPONSIVE TO THE REQUIREMENTS OF A-109, DoD 5000 SERIES DIRECTIVES AND SERVICE ACQUISITION POLICIES
- ON-GOING TEST AND EVALUATION OF THIS METHODOLOGY WILL INCLUDE LAND, AIR AND SEA SYSTEMS

STEP 3:

TRAINING RESOURCE REQUIREMENTS ANALYSIS

LARRY O'BRIEN

THE RELATIONSHIP OF TRRA TO OTHER STEPS OF THE METHODOLOGY



REASONS FOR EARLY TRAINING ESTIMATION

- INFLUENCE DESIGN ←
- PLAN TRAINING PRODUCTS

DESIGN EMPHASIS

- TRAINING REQUIREMENTS LINKED TO DESIGN CONCEPTS AND ALTERNATIVES
- TRAINING REQUIREMENTS LINKED TO MANPOWER REQUIREMENTS WHICH ARE IN TURN LINKED TO RELIABILITY AND OTHER ASPECTS OF SYSTEM DESIGN
- TRRA OUTPUT MEASURES AMENABLE TO IMPACT ANALYSIS (HIGH DRIVER'S IDENTIFIED)

QUESTION ?

HOW DO YOU ESTIMATE TRAINING FOR EQUIPMENTS WHICH DO NOT EXIST YET?

- "ASK A BUNCH OF EXPERTS"
- PARAMETRIC ANALYSIS
- COMPARABILITY ANALYSIS

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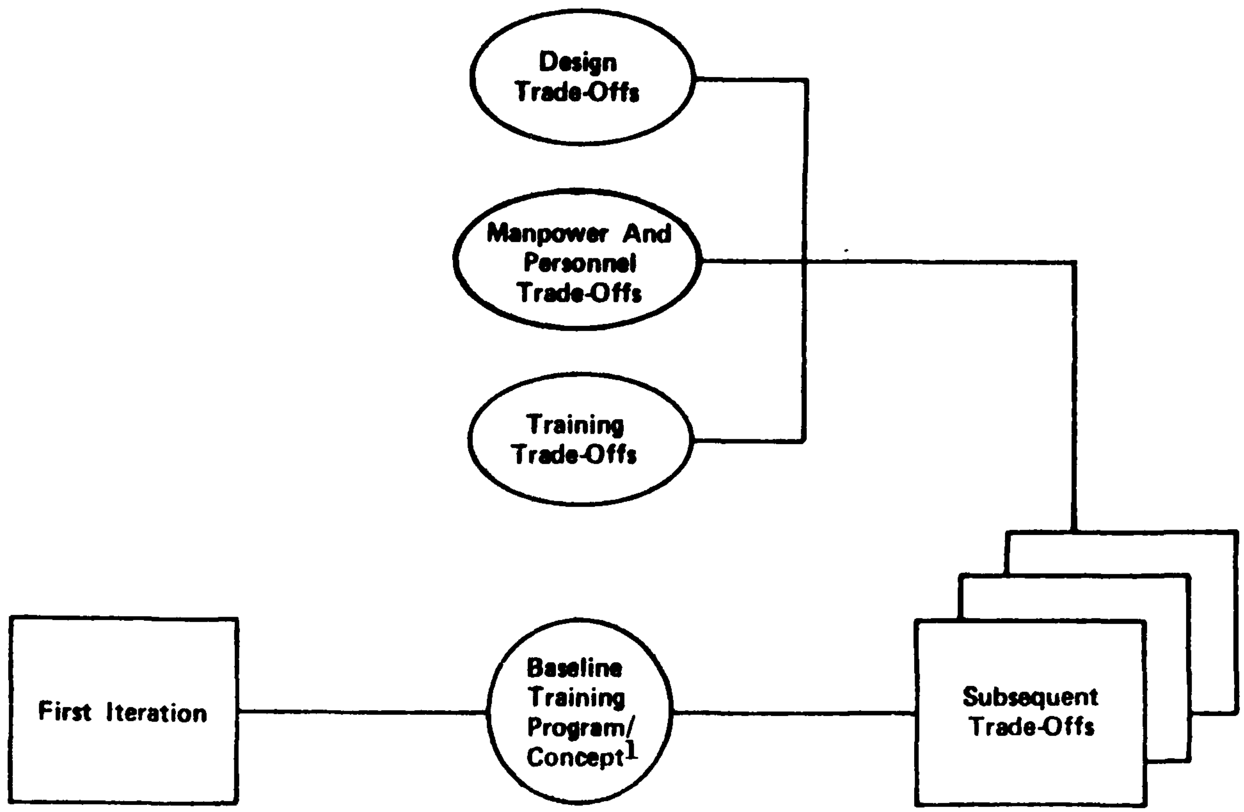
ESPAWS TRAINING COMPARABILITY ANALYSIS

DEFINE REFERENCE TRAINING PROGRAM	→ COLLECT DATA	→ IDENTIFY IMPACTS OF DESIGN DIFFERENCES	→ DEFINE CONCEPTUAL SYSTEM TRAINING PROGRAM
• Task Data	• AR611-201	• Δ Tasks	• Tasks
• Course Data	• Soldier's Manuals	• Δ Courses	• Courses
• Training Resource Data	• Programs of Instruction	• Δ Resources	• Resources
• Cost Data	• TRADOC Form 377-R		• Cost
	• MOSB Handbook		

ITERATIONS OF TRRA



[1]Baseline Training Program/Concept identifies task and skill requirements and ways in which similar tasks and skills are being trained on comparable systems. On subsequent iterations, alternative methods and media for training these tasks can be examined. However, these alternatives should only be examined if there is documented evidence that they are superior to the baseline methods/media.

DIFFERENCES BETWEEN TRRA AND ISD

	TRRA	ISD
OBJECTIVE	ESTIMATE REQUIREMENTS FOR PLANNING AND DESIGN, FEED ISD PROCESS	DEVELOP TRAINING PRODUCTS
ANALYTICAL FOCUS	AREAS RELATED TO DESIGN IMPACTS (INITIALLY)	TOTAL SYSTEM
DATA DEVELOPMENT STRATEGY	UTILIZE EXISTING DATA WHENEVER POSSIBLE	NEW ANALYSES

DRC

AD-A114 273 ARMY TRAINING DEVELOPMENTS INST FORT MONROE VA F/G 5/9

PROCEEDINGS OF THE TRADOC/TRAINING DEVELOPMENTS INSTITUTE (6TH)--ETC(U)

FEB 82

UNCLASSIFIED NL

2 OF 4

AD A114 273

TRAINING PROGRAM OUTLINE

1.0 BASIC DESCRIPTIVE DATA

- TRAINING PATHS (COURSES)
- TRAINING TASK DATA
- SKILLS AND KNOWLEDGES

RELATED APPENDICES

2.0 RESOURCES

- STUDENT REQUIREMENTS (REPLACEMENT PERSONNEL)
- INSTRUCTOR REQUIREMENTS
- TRAINING DEVICES
- OTHER

RELATED APPENDICES

3.0 COST

- COURSE COSTS
- OTHER COSTS

RELATED APPENDICES

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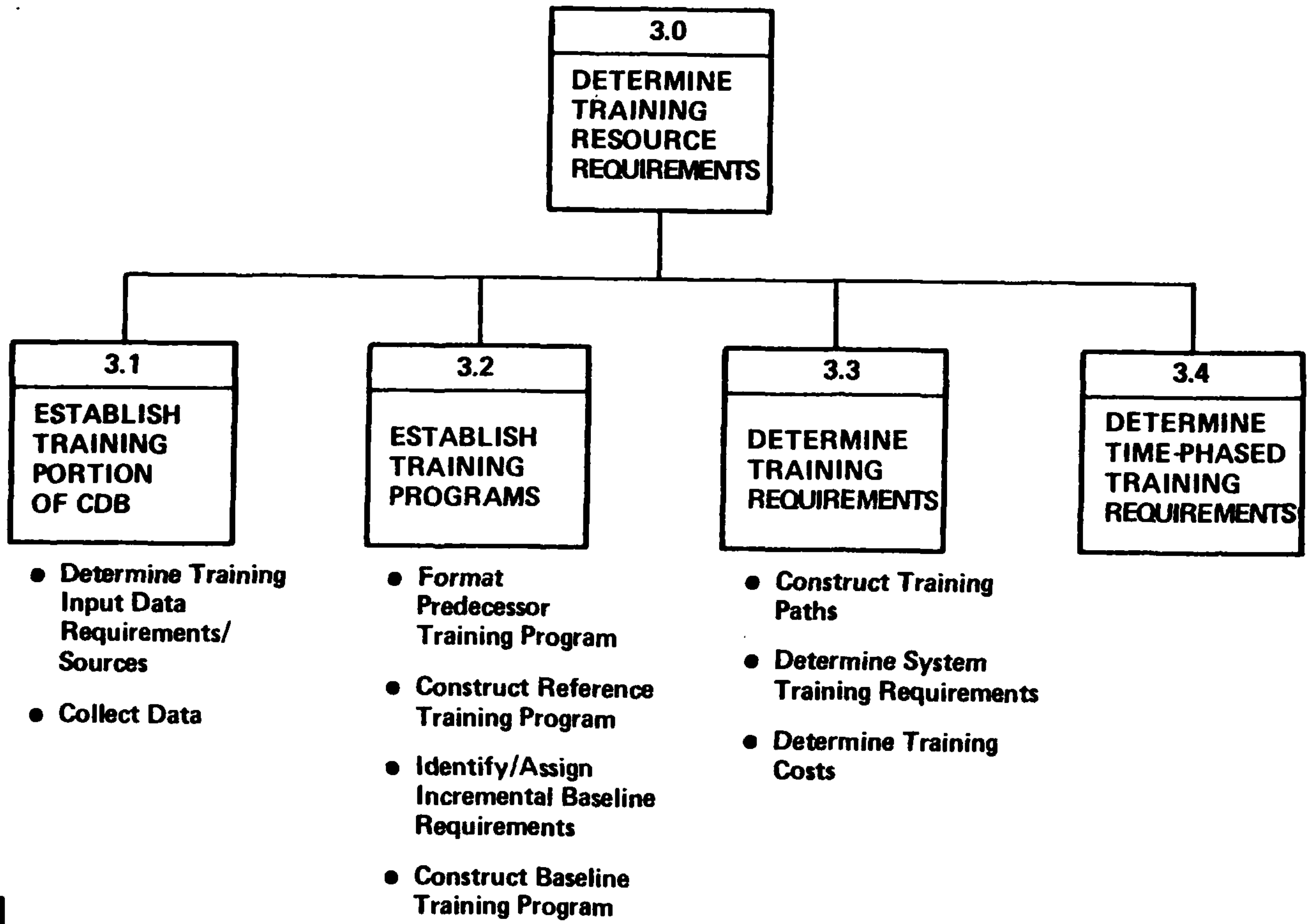
TRRA OVERVIEW



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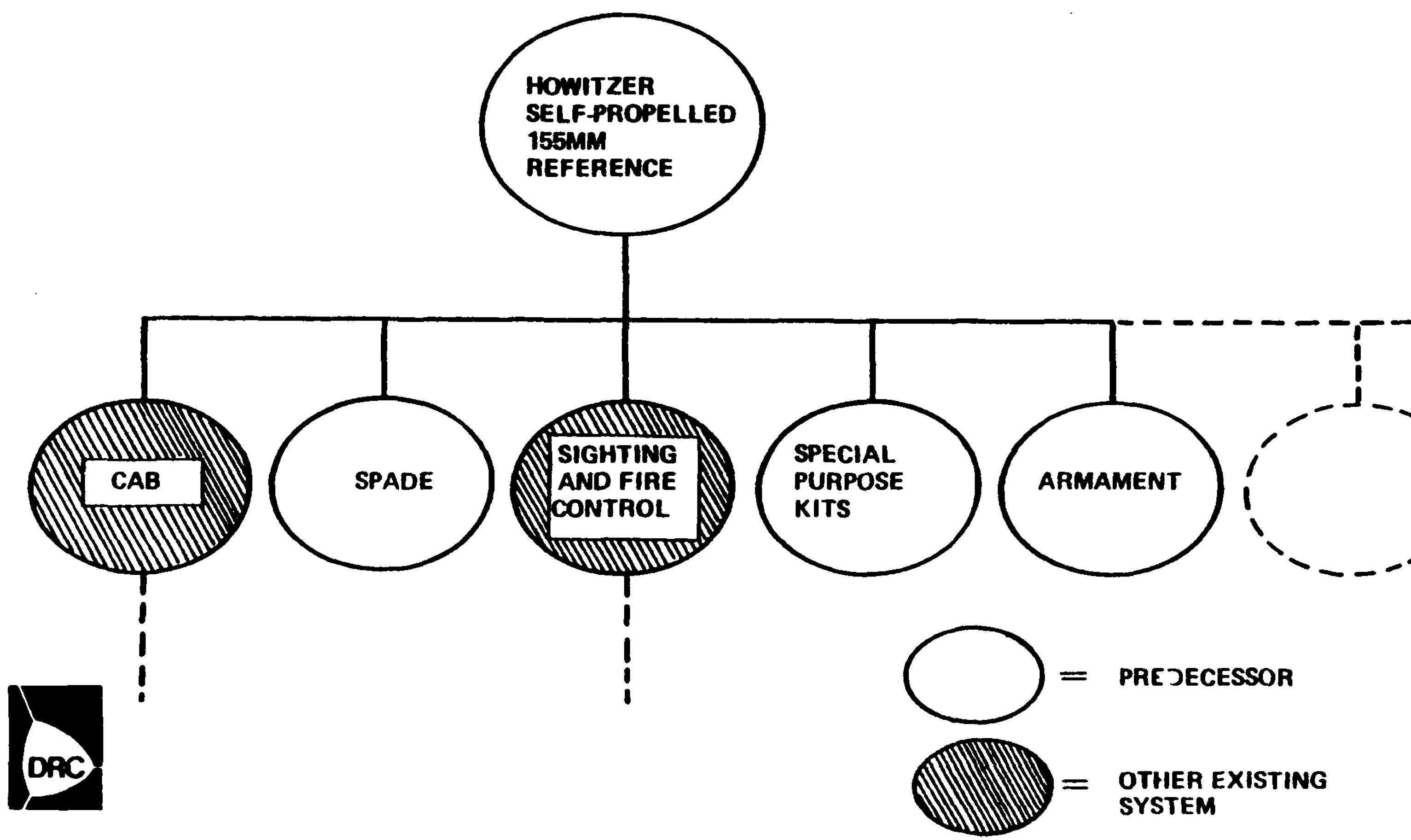
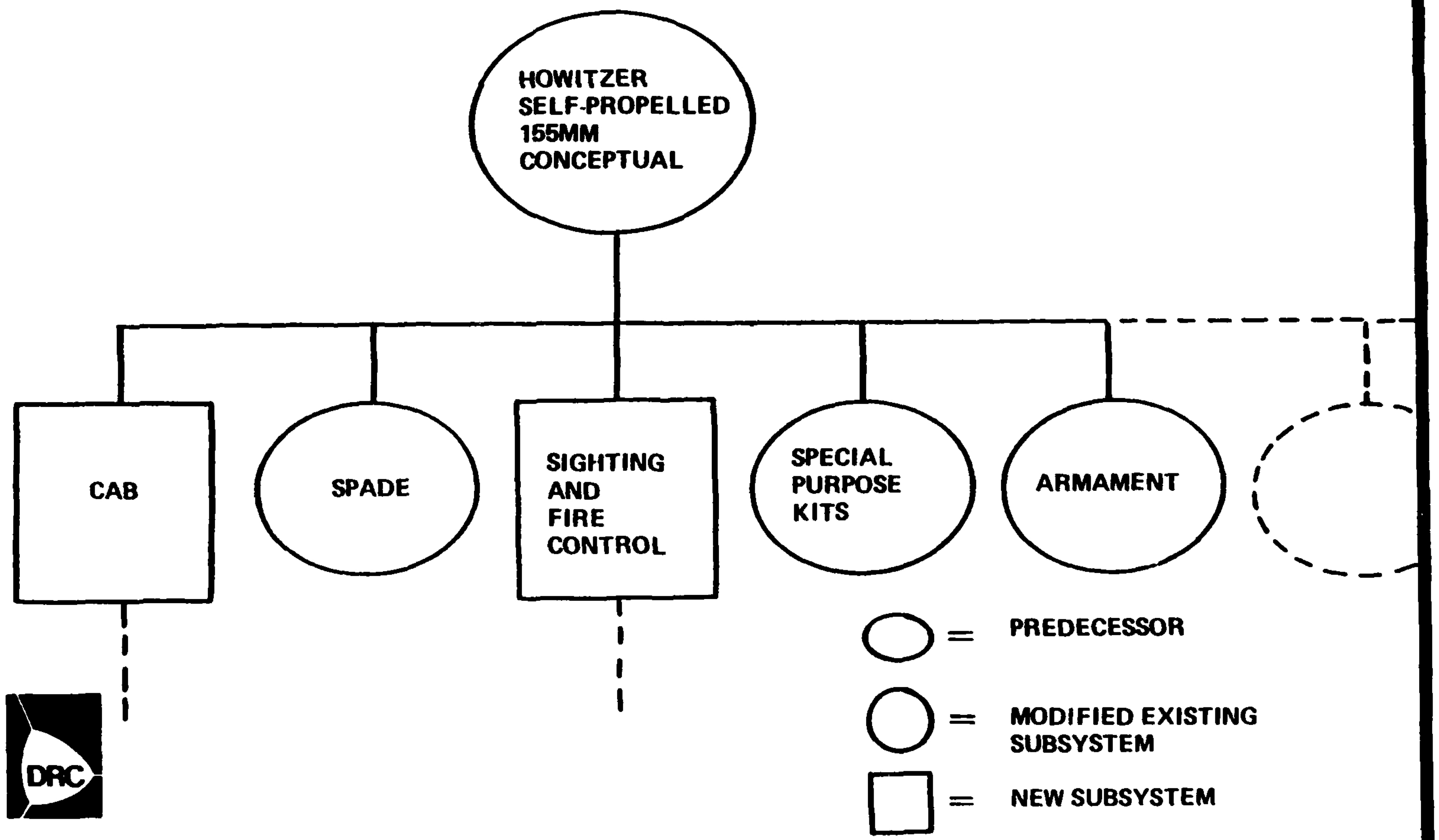
REFERENCE SYSTEM



CONCEPTUAL SYSTEM



DATA SOURCES – TRAINING

FUNCTIONAL AREA: TRAINING

CATEGORY	DATA	SOURCE
1. TASK REQUIREMENTS	Task by MOSC	Soldier's Manuals Commander's Manuals
	Tasks by System	Field Manuals Technical Manuals
	Tasks Accomplished by MOSC	Consolidated Occupational Data Analysis Program (CODAP)
	Maintenance Tasks Information	Field Manuals Technical Manuals
2. SKILL/ SKILL LEVELS	Task Requirements Required by Skill Level	Soldier's Manuals Commander's Manuals
	MOS Skill Description	AR611-201 Enlisted Career Management Fields and Occupational Specialties
	Qualification Standards	Skill Qualification Tests (SQT)

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DATA SOURCES – TRAINING

3. COURSE INFORMATION	Training Paths	Comptroller of the Army (COA): Military Occupational Specialty Cost Handbook
	Synopsis of Formal School Courses	U.S. Army Formal Schools Catalog, DA PAM 351-4
	Synopsis of Correspondence Courses	Army Correspondence Course Program
	Synopsis of Planned Army Training Courses	Individual and Collective Outline Training Plan (ICTP)
	Instructor Determination Data	TRADOC Form 377-R for Relevant Courses
4. TRAINING DEVICES/ EXTENSION TRAINING	List and Description of Current Items in Inventory	Index and Description of Army Training Devices (DA PAM 310-12) Catalog of TASO Training Devices (TRADOC PAM 71-9) Extension Material Status List (Quarterly Publication)

DATA SOURCES – TRAINING

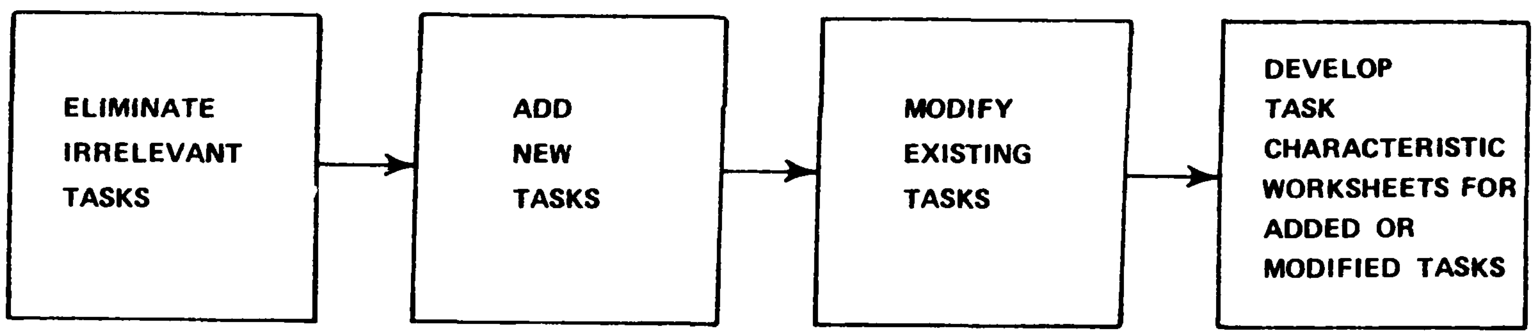
FUNCTIONAL AREA: COST

CATEGORY	DATA	SOURCE
1. TRAINING	Course Cost Elements: Aggregate	COA: Soldier Cost Information System: MOS Training Cost Handbook (MOSB)
	Detailed	TRADOC: Cost Analysis of Training Centers and Schools

ANALYZE TASK/SKILLS

- DELETE/ADD TASKS
- MODIFY TASK CHARACTERISTICS
- IDENTIFY SKILLS AND KNOWLEDGES
- IDENTIFY MOS/ASI
- IDENTIFY SKILL LEVELS

TASK MODIFICATION PROCEDURES



STEPS 3.2.2.1/3.2.3.1

DETAILED TRRA

TASK DELETION/MODIFICATION CODES

TASK DELETION

CODE	DESCRIPTION OF REASON FOR DELETION
ELI	ELIMINATION OF SUBSYSTEM
AUT	TASK AUTOMATION
MTBF	INCREASE IN MTBF
MP	CHANGE IN MAINTENANCE POLICY
O	OTHER – (MUST BE SPECIFIED)

TASK MODIFICATION

CODE	DESCRIPTION OF TYPE OF MODIFICATION	REQUIRES TASK CHARACTERISTIC WORKSHEET
NC	NO CHANGE IN SYSTEM-SPECIFIC TASK	NO
MIN	MINOR TASK MODIFICATION–TASK ESSENTIALLY THE SAME. ONLY MINOR CHANGES IN EQUIPMENT/NOMENCLATURE REQUIRED.	NO
REL	FREQUENCY CHANGE – SAME TASK BUT TASK IS PERFORMED MORE (LESS) FREQUENTLY DUE TO CHANGE IN RELIABILITY	YES
SKI	SKILL LEVEL CHANGE – TASK ESSENTIALLY THE SAME BUT ASSIGNED TO DIFFERENT SKILL LEVEL.	YES
MAJ	MAJOR TASK MODIFICATION – SIGNIFICANT CHANGE IN SKILLS AND KNOWLEDGES AND/OR OTHER TASK CHARACTERISTICS (E.G., DIFFICULTY, IMPORTANCE).	YES

STEPS 3.2.2.1/3.2.3.1

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DETAILED TRRA

SUMMARY OF TASK-RELATED IMPACTS

	REFERENCE					CONCEPTUAL				
MOS	AUT.	MIN.	REL.	MAJ.	ADD.	AUT.	MIN.	REL.	MAJ.	ADD.
13B	2	46	22	16	4	0	0	3	0	0
(45D)*	–	–	–	–	6	–	–	–	–	0
31V	0	0	0	0	13	0	0	0	0	0
41C	0	0	11	0	0	0	0	0	0	0
44B	0	0	0	0	0	0	0	0	0	0
45K	0	10	0	0	0	0	0	1	0	0
45L	0	18	0	0	10	0	0	3	0	0
63B	0	0	0	0	0	0	0	0	0	0
63C	0	0	0	0	0	0	0	0	0	0
TOTAL	2	83	33	16	33	0	0	13	0	0

TASK DELETION	AUT. – AUTOMATION TASK DELETION
TASK MODIFICATION	MIN. – MINOR TASK MODIFICATION REQUIRED REL. – CHANGE IN TASK FREQUENCY; OTHERWISE TASK ESSENTIALLY THE SAME MAJ. – MAJOR TASK MODIFICATION REQUIRED
TASK ADDITION	ADD. – NEW, ADDITIONAL TASK REQUIRED

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*Complete task listing for 45D not yet available.

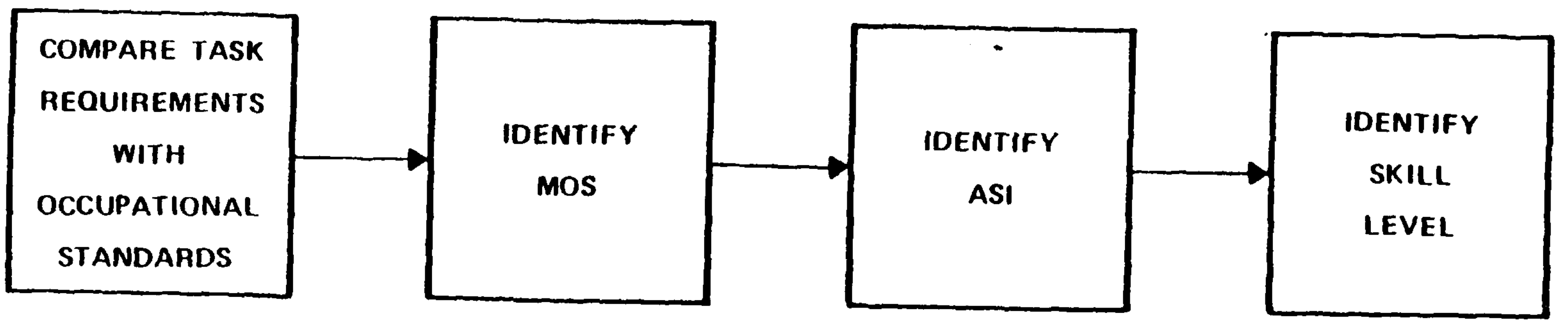
TASK TYPES SELECTED FOR TASK CHARACTERISTIC ANALYSIS

		Task Characteristic Analysis
NON-SYSTEM SPECIFIC		NO
SYSTEM SPECIFIC	NC	NO
	MIN	NO
	MAJ	YES
	SKI	YES
	REL	YES

DRC DETAILED TRRA

STEPS 3.2.2.1/3.2.3.1

OVERVIEW OF MOS/ASI/SKILL LEVEL DETERMINATION



STEPS 3.2.2.1/3.2.3.1

1081-010-6

DETERMINE TRAINING SETTING

- UNMODIFIED TASKS
  - UTILIZE EXISTING ASSIGNMENT FOR INITIAL BASELINE TASKS
- MODIFIED TASKS
  - EXAMINE TASK CHARACTERISTIC DIFFERENCES
  - IDENTIFY ASSIGNMENTS FOR TASKS WITH SIMILAR CHARACTERISTICS
- NEW TASKS
  - IDENTIFY COMPARABLE TASKS
  - DEVELOP TASK CHARACTERISTICS
  - IDENTIFY ASSIGNMENTS FOR TASKS WITH SIMILAR CHARACTERISTICS
  - ASSIGN SETTINGS

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DETERMINE BASELINE COURSE REQUIREMENTS

- ADD/DELETE COURSE MODULES
- DETERMINE INSTRUCTIONAL METHOD FOR EACH MODULE
- DETERMINE STUDENT INSTRUCTOR RATIOS FOR EACH MODULE
- DETERMINE LENGTH OF EACH MODULE

MODIFIED AND ADDITIONAL COURSES DEVELOPED FOR ESPAWS

MODIFIED COURSES:

Course No.	Title	Length*	MOS
041-13B10	FIELD ARTILLERY CREWMAN	12.5 (12.4) weeks	13B
643-45D10	FIELD ARTILLERY TURRET MECHANIC	5.2 (4.8) weeks	45D (13BU6)

ADDITIONAL COURSES:

Course No.	Title	Length	MOS
101ASIX1	ESPAWS COMPUTER	1.89 weeks	31V
101ASIX2	ESPAWS LAND NAVIGATION SYSTEM	2.8 weeks	31V
642ASIX1	ESPAWS AUTOLOADER	3.4 weeks	45L

*Existing course length in parentheses.

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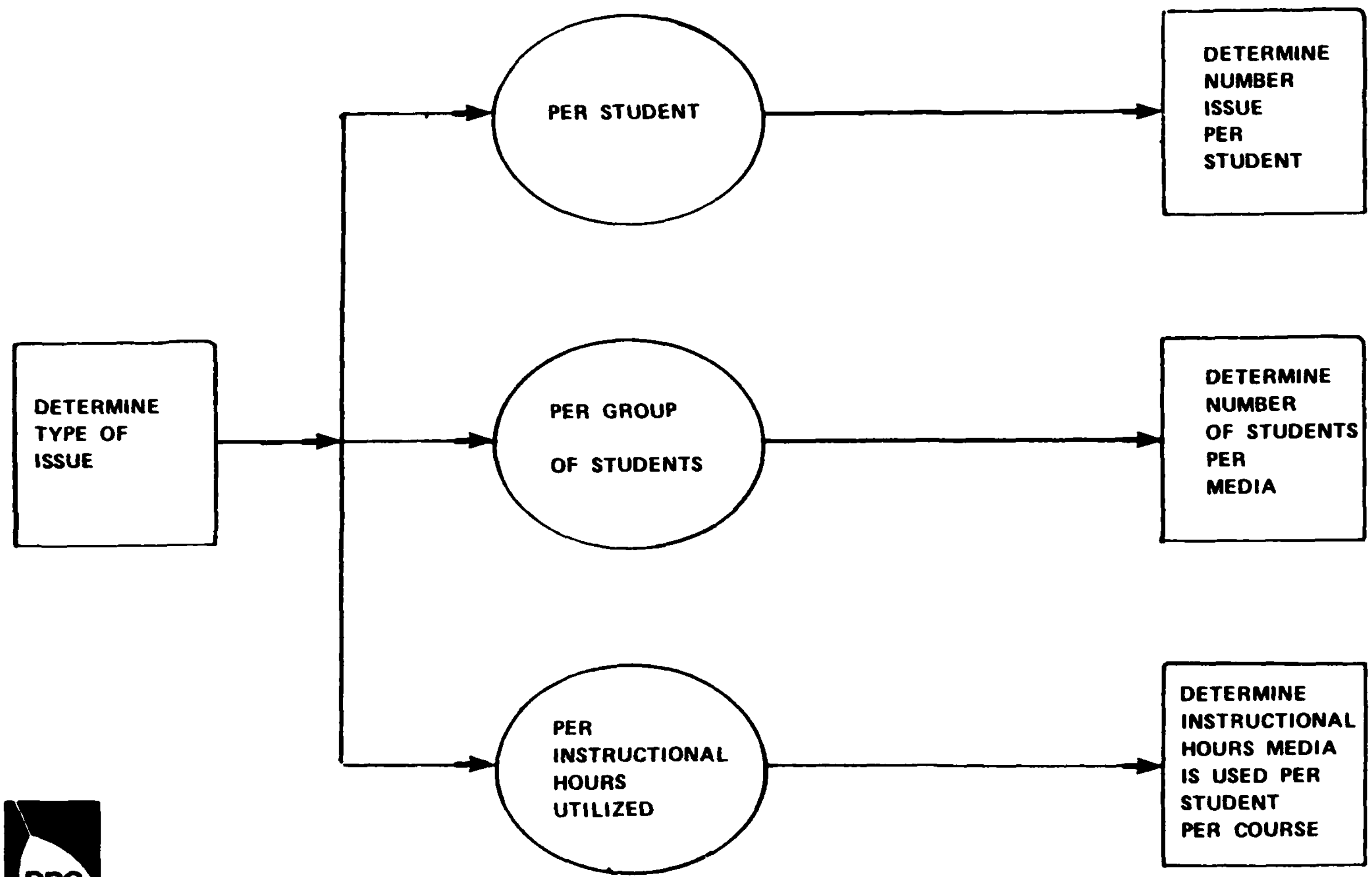
DETERMINE MEDIA REQUIREMENTS

- ASSIGN TASKS AND/OR SKILLS AND KNOWLEDGES TO GENERIC MEDIA CATEGORIES BY
  - (a) Applying media selection algorithm
  - (b) Identifying assignments for similar tasks and skills on comparable equipments
- REVIEW GENERIC MEDIA REQUIREMENTS WITH PROGRAM MANAGER
- IDENTIFY REPRESENTATIVE MEDIA
- IDENTIFY USAGE RATE FOR MEDIA

Steps 3.2.2.4/3.2.3.4

DETERMINE USAGE RATES FOR MEDIA



Steps 3.2.2.4/3.2.3.4

EXAMPLE OF GENERAL TRAINING DEVICE DESCRIPTION

Training Device	Operator/ Maintainer	Type	Description	Comparable Devices
ESPAWS Electrical/ Hydraulic Systems Maintenance Trainer	Maintainer	Two-dimensional (2D) Programmable	Provides trining in the proper troubleshooting procedures for the ESPAWS electrical/hydraulic systems for both organizational and DS/OS personnel.	M60A1/A3 Tank Programmable Trainer
ESPAWS Autoloader Maintenance Trainer	Maintenance	Three-dimensional (3D) Programmable	Provides training in functional testing, inspection, and removal/replacement of selected components of the ESPAWS autoloader.	Army Maintenance Training and Evaluation Simulation System (AMTESS)
ESPAWS Crew Trainer	Operator	Embedded Crew Trainer	Provide ESPAWS crew training for indirect fire missions including tasks related to orientation, and firing.	No devices are exactly comparable. But device may include features similar to both the M60A2 conduct of fire launcher trainer (minus the visual effect simulator) and systems which more of an emphasis on software-related implementation such as the Patriot Command Station Trainers.
ESPAWS Howitzer Driver Trainer	Operator	3D Simulator	Provide training for the driver of the ESPAWS Howitzer over a wide range of environments and driving conditions.	XM1 Tank Trainer; Track Vehicle Trainer—M60 Series Tank
ESPAWS Direct Fire Trainer	Operator	(1) Laser-mounted Target (2) Laser-towed Target	Provide ESPAWS crew training for direct fire missions.	1) Multiple Integrated Laser Engagement System (MILES) 2) Field Artillery Direct Fire Trainer-Laser
ESPAWS Computer Operational Check and Fault Isolation System.	Operator/ Maintainer	Completely Embedded Software	Provide training in the operational check and fault isolation of the ESPAWS computer.	Many existing military embedded software systems have this capability.

STEPS 3.2.2.4/3.2.3.4

ASSIGN COURSES TO CAREER PATHS

- DETERMINE COURSE SEQUENCE/GROUPINGS
- ASSIGN COURSES TO CAREER PATH (PAYGRADE)
- DETERMINE PERCENTAGES TAKING EACH PATH

STEP 3.3.1.1

DETERMINE RESOURCE REQUIREMENTS

- DETERMINE NUMBER OF INSTRUCTORS
- DETERMINE TRAINING DEVICE/EQUIPMENT REQUIREMENTS
- IDENTIFY MILCON NEEDS
- IDENTIFY EMBEDDED TRAINING RESOURCE REQUIREMENTS
- DETERMINE REQUIREMENTS FOR OTHER TRAINING RESOURCES

Step 3.3.2.2

NUMBER OF INSTRUCTORS

- DETERMINE INSTRUCTOR CONTACT HOURS PER COURSE (FUNCTION OF STUDENT/INSTRUCTOR RATIO, OPTIMUM CLASS SIZE AND INSTRUCTIONAL HOURS PER METHOD)

- APPLY MODIFIED VERSION OF INSTRUCTOR DETERMINATION ALGORITHM FROM DA PAM 570-558, STAFFING GUIDE FOR U.S. ARMY SERVICE SCHOOLS.

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INSTRUCTOR REQUIREMENTS

NUMBER OF INSTRUCTOR PERSONNEL

MOS	Predecessor	Reference	Conceptual
13B	508.3	281.8	316.4
31V	0	14.6	13.4
41C	4.7	4.7	4.7
44B	2.8	2.8	2.7
45D	0	15.9	3.1
45K	17.3	23.3	23.3
45L	6.	11.9	14.2
63B	0	0	0
63C	.9	.9	.9
Totals	540.0	355.9	378.7

DRC

DETERMINE REQUIREMENTS FOR OTHER RESOURCES

ISSUED PER STUDENT

$$\text{NO. PER STUDENT} \times \text{STUDENT LOAD} = \text{NUMBER REQUIRED}$$

ISSUED PER GROUP OF STUDENTS

$$\text{STUDENT LOAD} \div \text{NO. OF MEDIA ISSUED PER STUDENT} = \text{NUMBER REQUIRED}$$

ISSUED PER INSTRUCTIONAL HOURS UTILIZED

$$\frac{\text{INSTRUCTIONAL HOURS PER STUDENT PER COURSE} \times \text{NO. OF STUDENTS} \times \text{NO. OF CONCURRENT COURSES PER SITE}}{\text{MAXIMUM UTILIZATION RATE PER DEVICE}} = \text{NUMBER REQUIRED}$$

Step 3.3.2.2

EMBEDDED TRAINING REQUIREMENTS

- DETERMINE CONSTRAINTS
- CALCULATE RESOURCE REQUIREMENTS
- EVALUATE REQUIREMENTS AGAINST CONSTRAINTS

OVERVIEW OF TRAINING COSTS

- COURSE COSTS
- INSTRUCTOR COSTS
- OTHER

STEP 3.3.3

COURSE COSTS

- INDIVIDUAL STUDENT COST PER COURSE – COST TO TRAIN AN INDIVIDUAL IN A PARTICULAR COURSE
- AVERAGE INDIVIDUAL TRAINING COST – A MEASURE OF THE AVERAGE COST TO TRAIN AN INDIVIDUAL WHO COMPLETES THE ENTIRE CAREER PATH IN EACH OF THE RATINGS ASSOCIATED WITH THE SYSTEM
- REPLACEMENT PERSONNEL TRAINING COST – MOST REALISTIC MEASURE OF TRAINING COST – THE COST OF TRAINING REPLACEMENT PERSONNEL FOR TRAINING DIRECTLY RELATED TO THE SYSTEM
- CUMULATIVE PERSONNEL TRAINING COST BY PAYGRADE – A MEASURE OF THE CUMULATIVE TRAINING COST FOR REPLACEMENT PERSONNEL AT SPECIFIC POINTS IN THE CAREER PATH

DRC

STEP 3.3.3

REPLACEMENT PERSONNEL TRAINING COSTS

MOS	Predecessor	Reference	Conceptual
13B	86,954,622	52,190,075	57,430,401
31V	0	10,266,144	1,403,416
41C	1,310,361	1,310,361	1,310,361
44B	589,850	589,850	589,850
45D	–	10,688,577	2,500,929
45K	6,220,093	8,401,778	8,401,778
45L	1,415,636	3,428,810	3,968,695
63B	228,259	228,259	228,259
63C	1,437,982	1,704,488	1,704,488
TOTAL (1980 DOLLARS) –	98,156,803	88,768,342	77,538,177
INFLATION FACTOR –	x 1.14	x 1.14	x 1.14
TOTAL (1981 DOLLARS) –	111,898,760	101,195,910	88,393,522

DRC

CURRENT LIMITATIONS OF TRRA

- MAJOR AREAS FOR IMPROVEMENT
  - UNIT TRAINING REQUIREMENTS AND COST
  - COLLECTIVE TRAINING REQUIREMENTS AND COSTS
  - DATA BASE MANAGEMENT FOR TASK/TRAINING DATA
  - DATA GENERATION
  - HUMAN PERFORMANCE–SYSTEM PERFORMANCE SIMULATION MODEL

- OTHER AREAS
  - PROCEDURES FOR ASSIGNING TRAINING SETTING
  - PROCEDURES FOR ASSIGNING MOS/AI, DUTY POSITION, AND SKILL LEVEL
  - PROCEDURES FOR DETERMINING INSTRUCTIONAL METHODS AND MEDIA
  - COST ESTIMATING PROCEDURES

EARLY TRAINING ESTIMATION SYSTEM (ETES)

CONTRACT MONITOR Dr. Chuck Jorgensen, ARI

PROJECT MANAGER Dr. Larry O'Brien

DRC

PROBLEMS OF EARLY TRAINING ESTIMATION

- INFORMATION
  - LACK OF A SYSTEMATIC FLOW OF TASKS AND TRAINING INFORMATION AMONG PARTICIPANTS IN THE ACQUISITION PROCESS
- TOOLS
  - CURRENT TRAINING ESTIMATION TOOLS ARE NOT GEARED FOR EARLY ACQUISITION PROCESS

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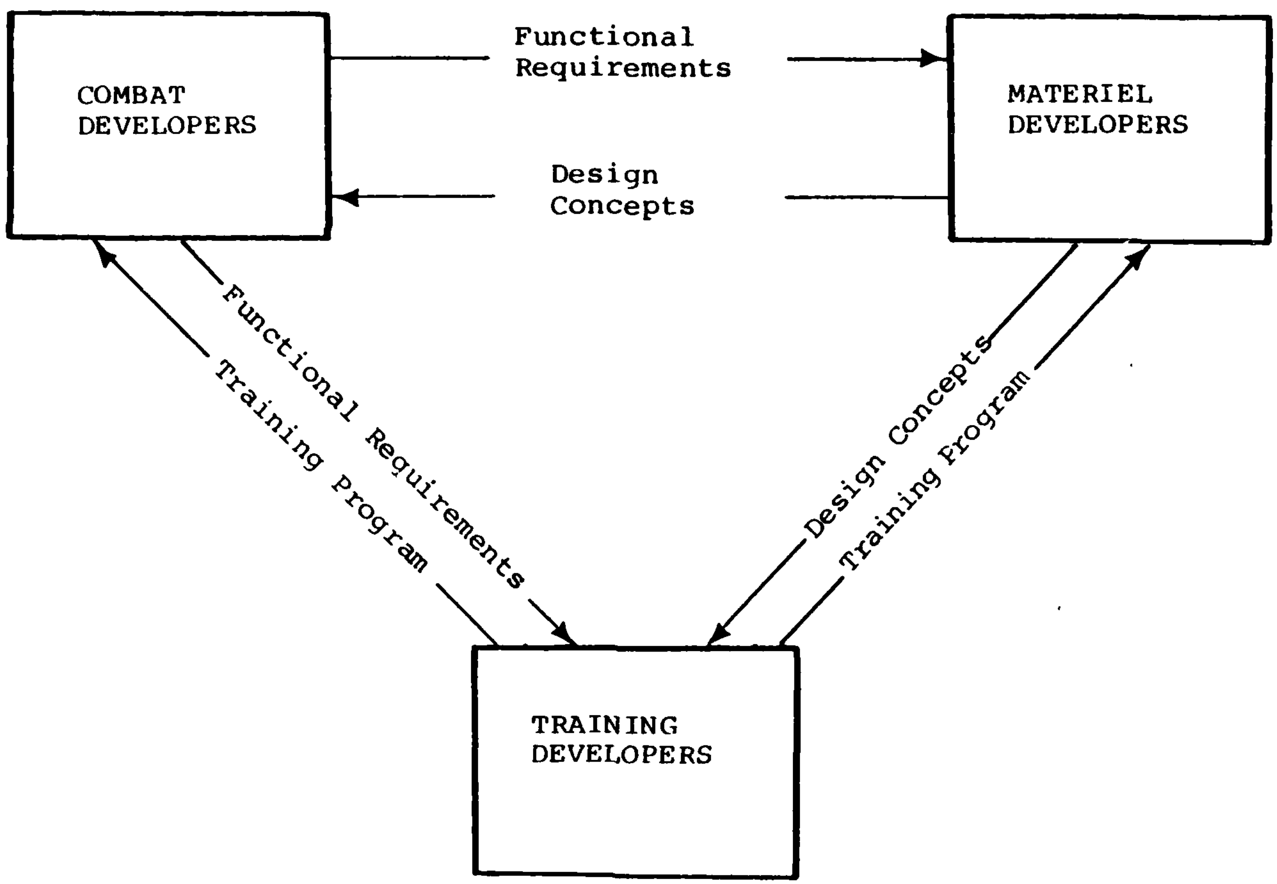
DEVELOPMENT OF EARLY ESTIMATION SYSTEM



NEED FOR EARLY ESTIMATION TOOLS

TRAINING ESTIMATION AIDS/PROCEDURES

- DATA GENERATION (TASKS, SKILLS AND KNOWLEDGES, COURSES, MEDIA, COSTS)
- TRAINING ESTIMATION
  - ASSIGNMENT ALGORITHMS/PROCEDURES (MOS/ASI/SKILL LEVEL, TRAINING SETTING, METHOD, MEDIA)
  - RESOURCE
  - COST

"EARLY" SIMULATION MODELS – MODELS WHICH RELATE TASK PERFORMANCE TO SYSTEM PERFORMANCE USING THE TYPES OF DATA AVAILABLE DURING EARLY PHASES

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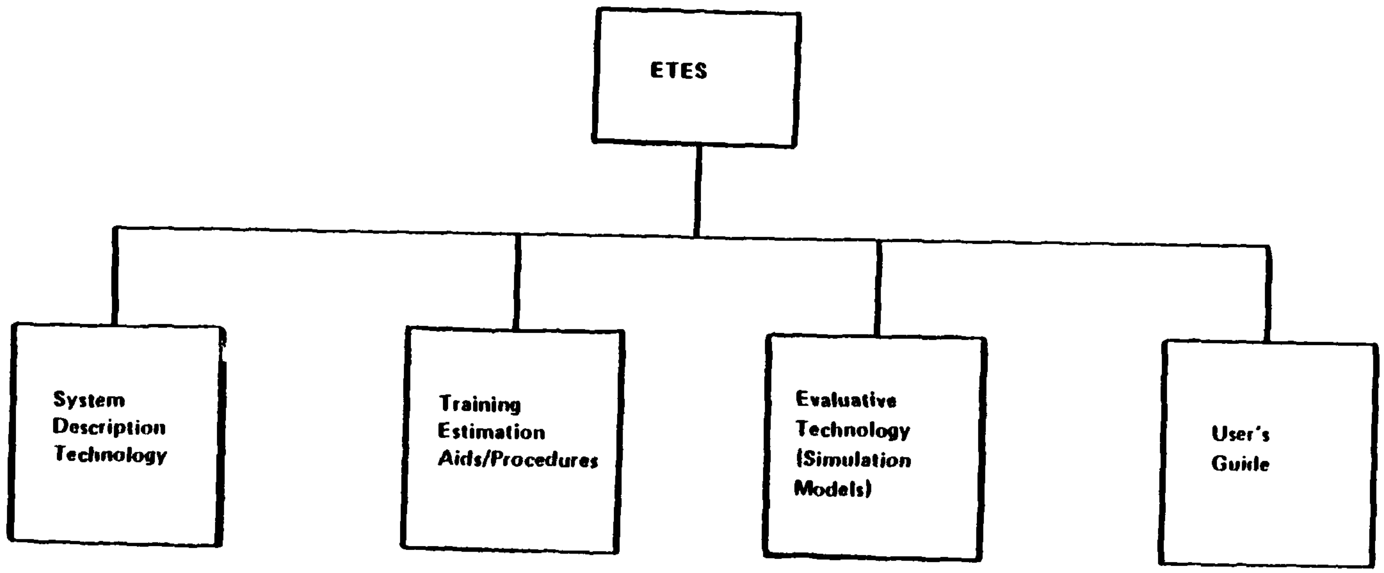
ETES COMPONENTS



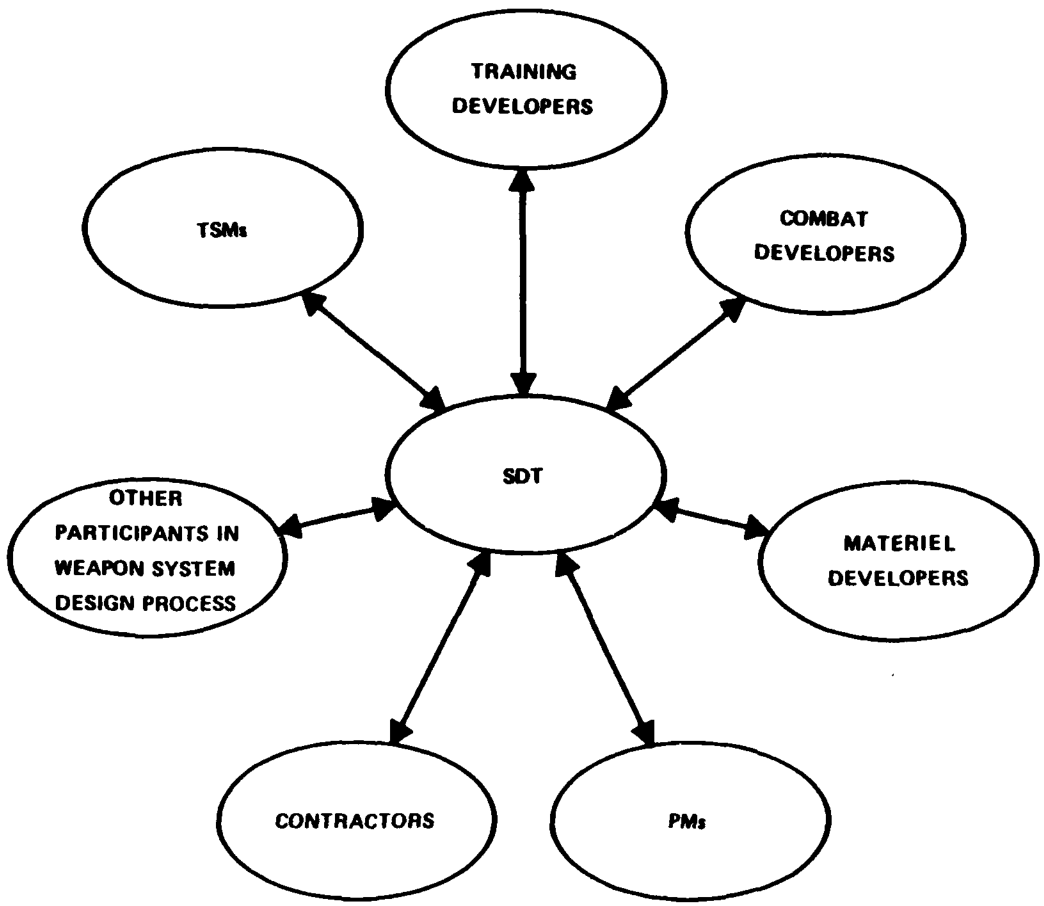
WHAT IS SDT?

DATA BASE MANAGEMENT SYSTEM

- SYSTEM DATA
- TASK DATA
- TRAINING DATA

- STORING
- UPDATING
- MODIFYING
- OUTPUTTING (IN A VARIETY OF FORMATS)

CENTRAL COMMUNICATION ROLE OF SDT



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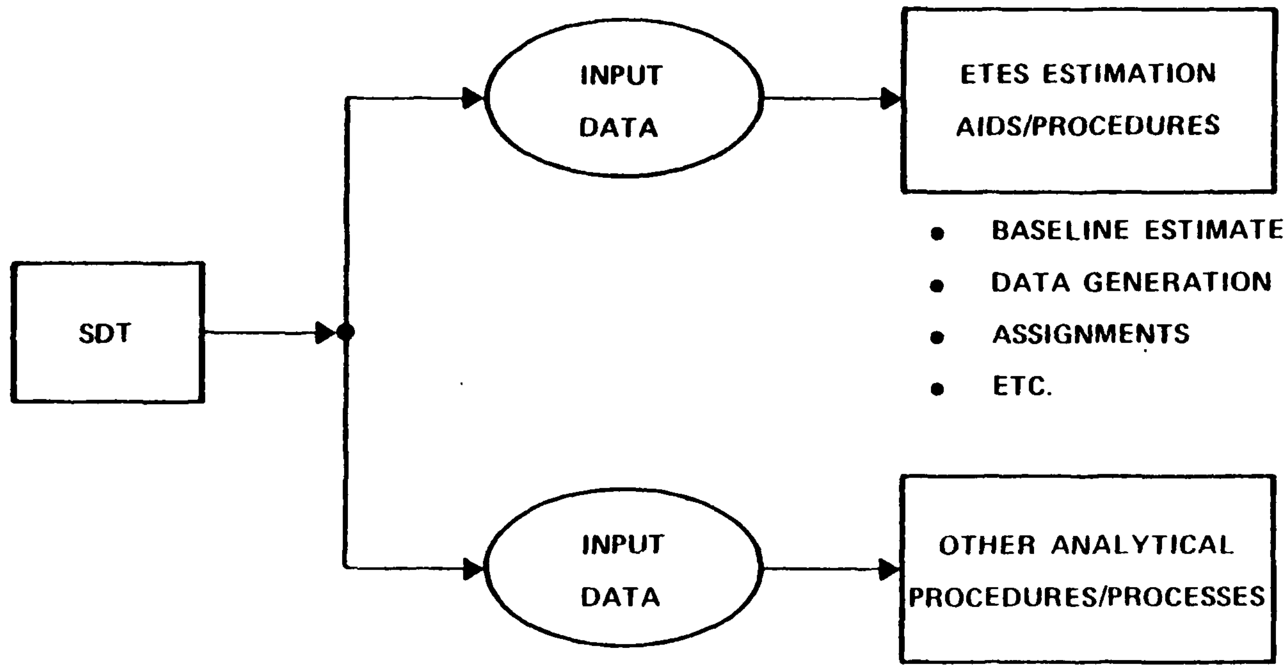
ROLE OF SDT

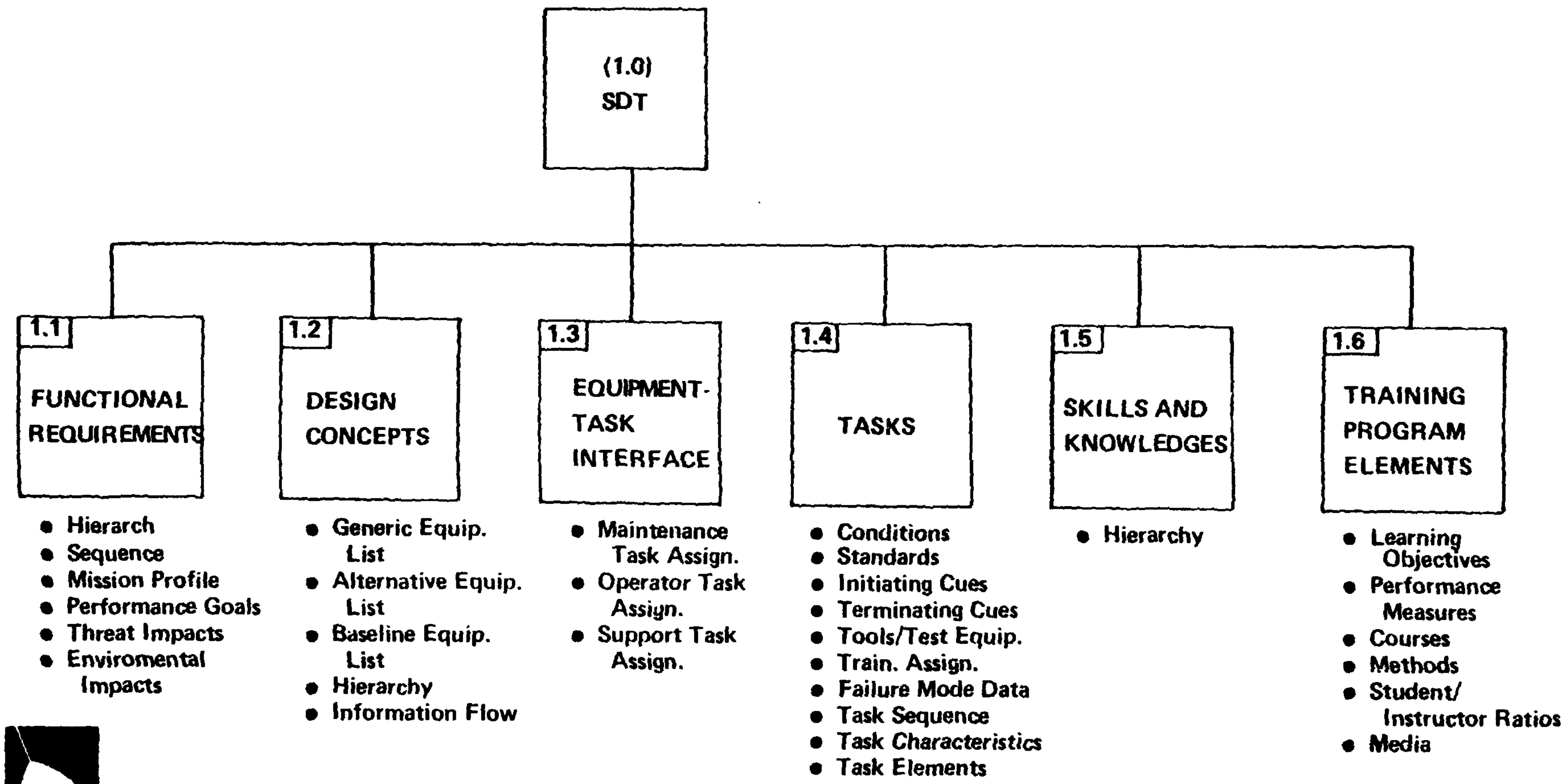


- BASELINE ESTIMATE
- DATA GENERATION
- ASSIGNMENTS
- ETC.

- LSA
- CTEA
- OICTP/ICTP
- ETC.

1081-010-5

SDT DATA ELEMENTS

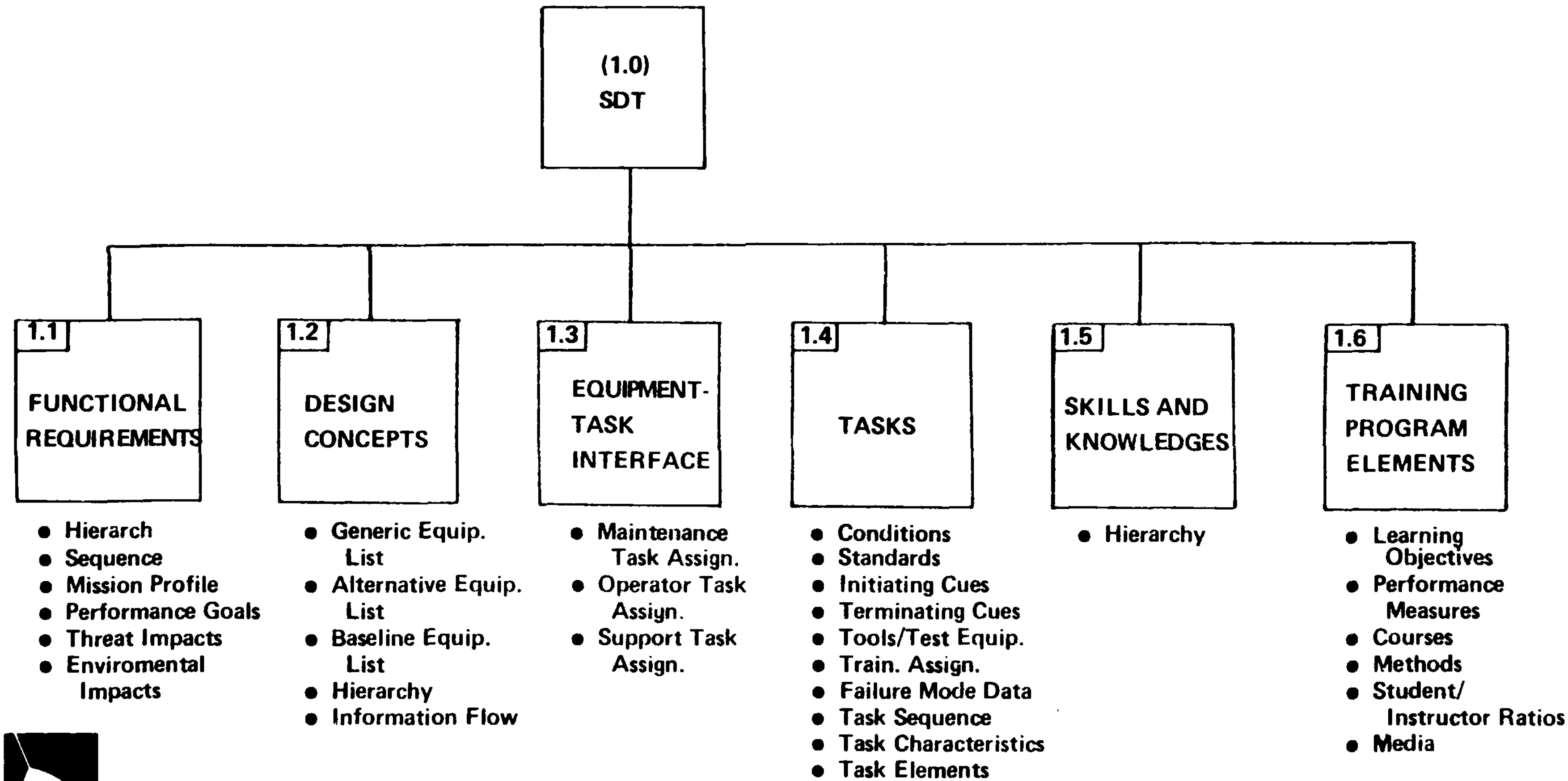


DRC

ADVANTAGES OF DBMS

- SPECIFICALLY DESIGNED TO DEAL WITH PROBLEMS OF INFORMATION COMMUNICATION
- PROVIDES INTEGRATED CENTRALIZED CONTROL OF DATA
- REDUCES REDUNDANCY IN STORED DATA
- AVOIDS INCONSISTENCY IN STORED DATA
- ALLOWS FOR GREATER SHARING OF DATA
- PERMITS STANDARDS TO BE ENFORCED
- PERMITS SECURITY RESTRICTIONS TO BE APPLIED
- PROVIDES A GREATER CAPABILITY FOR CHECKING AND MAINTAINING DATA

SDT DATA ELEMENTS



DRC

ADVANTAGES OF DBMS

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- PROVIDES INTEGRATED CENTRALIZED CONTROL OF DATA
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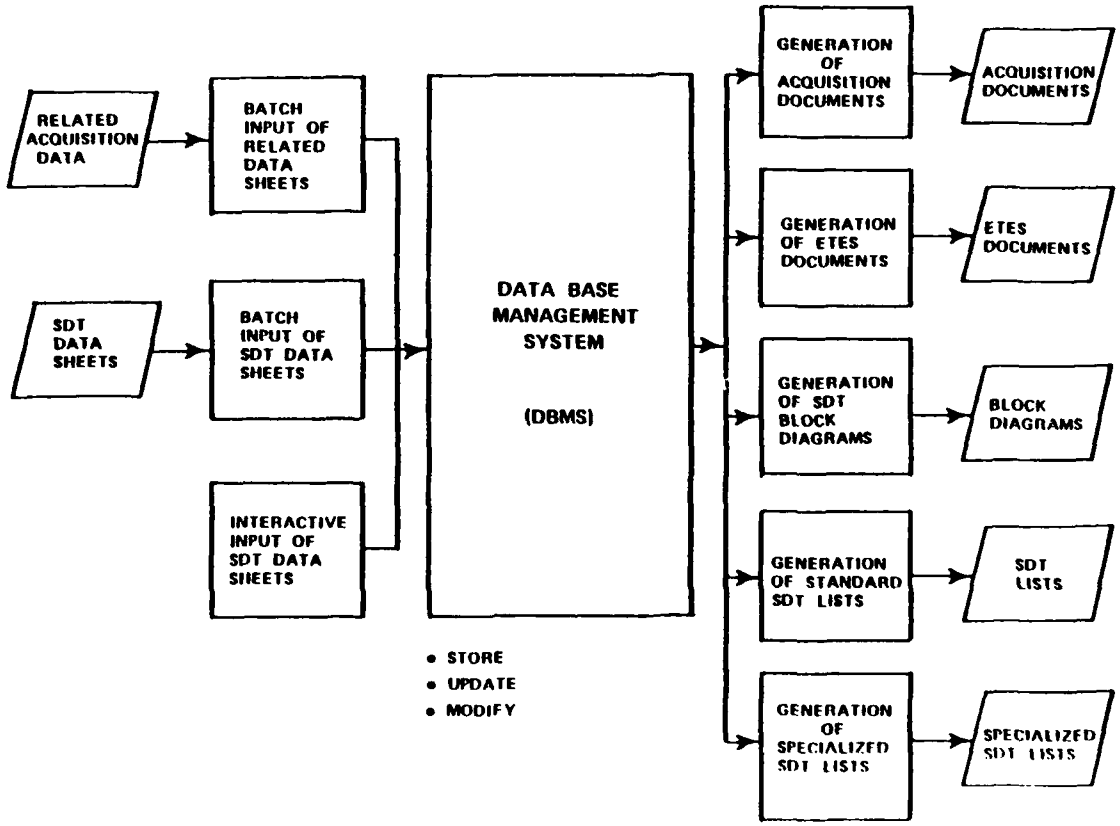
- PERMITS STANDARDS TO BE ENFORCED
- PERMITS SECURITY RESTRICTIONS TO BE APPLIED
- PROVIDES A GREATER CAPABILITY FOR CHECKING AND MAINTAINING DATA

OVERVIEW OF SDT INPUT/OUTPUT OPERATIONS



SDT USERS

TYPE	EXPECTED COMPUTER EXPERIENCE	ROLE
PRIMARY USERS	NONE	INPUT, REVIEW, UPDATE, MODIFY, STORE, AND OUTPUT SDT DATA ELEMENTS
DATA BASE DIRECTOR	NONE	ALL OF THE ABOVE. IN ADDITION, OVERSEE THE DEVELOPMENT OF SYSTEM-SPECIFIC SDT AND PROVIDE GRAPHICS CAPABILITY
SDT MANAGEMENT GROUP	EXTENSIVE	ALL OF THE ABOVE. IN ADDITION, MAINTAIN SDT DBMS; OPERATE CENTRAL PROCESSOR; DIRECT AND MAINTAIN PHYSICAL STORAGE; ASSIST USERS IN UTILIZING SDT; PROVIDE FORMAL TRAINING IN SDT; PLAN, DEVELOP, AND IMPLEMENT SDT IMPROVEMENTS; PROVIDE USE OF SDT AMONG ARMY ORGANIZATIONS

POTENTIAL PRIMARY USERS

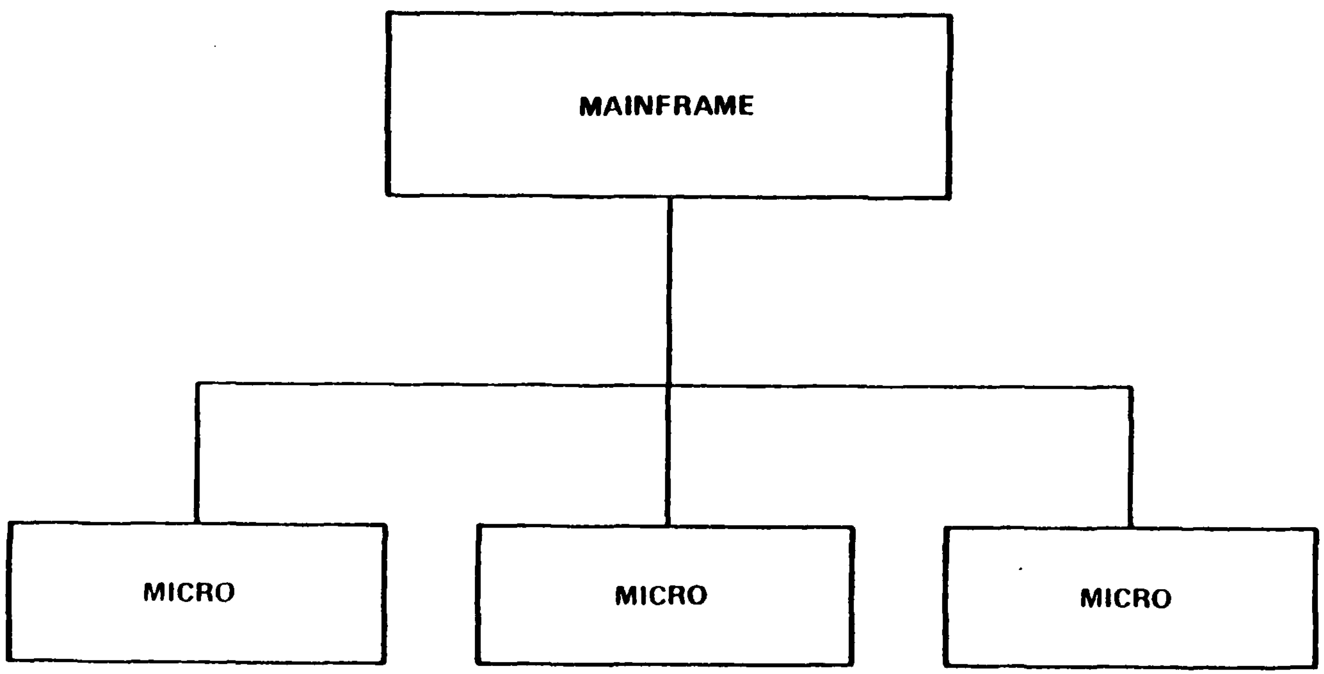
- TRADOC SYSTEM MANAGER (TSM) FOR SYSTEM
- TRAINING DEVELOPMENTS (WITHIN RELATED SCHOOL)[1]
- COMBAT DEVELOPMENTS (WITHIN RELATED MISSION AREA)
- DARCOM PROGRAM MANAGEMENT STAFF FOR SYSTEM[1]
- TRADOC SYSTEMS ANALYSIS ACTIVITY (TRASANA)
- DARCOM MATERIEL READINESS SUPPORT ACTIVITY (MRSA)[2]
- INDIVIDUAL CONTRACTORS
- OTHERS

[1]INDICATES ORGANIZATION LIKELY TO HAVE MORE THAN ONE TERMINAL INTERFACING WITH SDT.

[2]THE MRSA CONNECTION WITH THE SDT WILL BE DESIGNED TO PROVIDE AN SDT INTERFACE WITH THE AUTOMATED LSAR.

DRC

DISTRIBUTED PROCESSING



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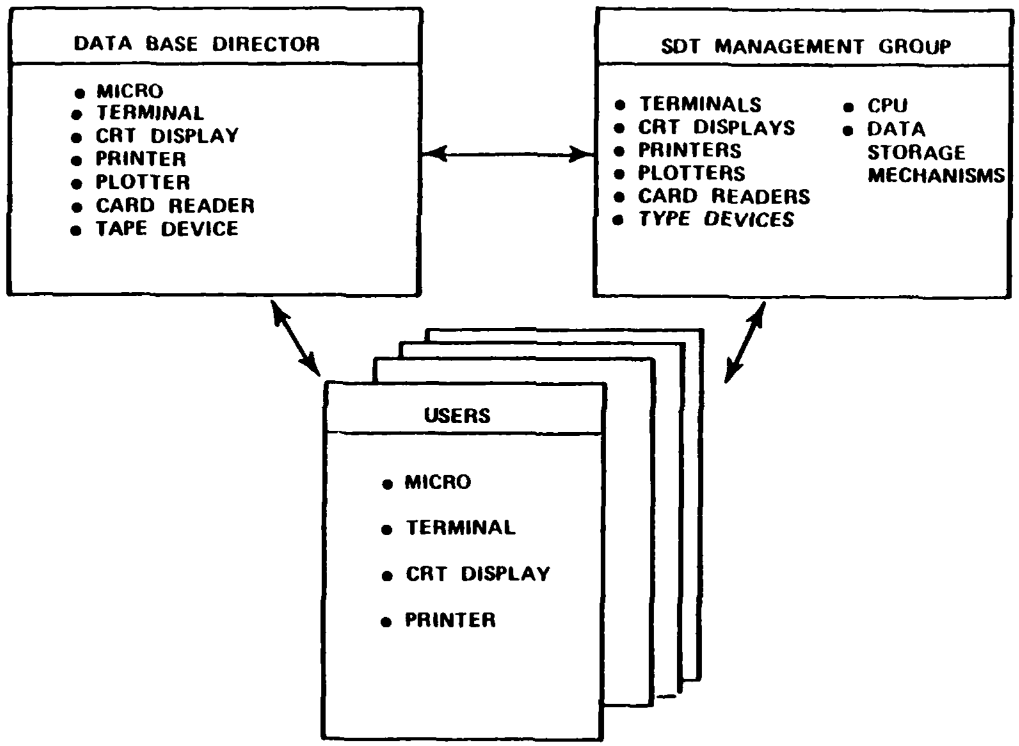
OVERVIEW OF SDT PHYSICAL STRUCTURE



USER-FRIENDLY FEATURES OF SDT

1. "USER-FRIENDLY" DIALOGUE TYPES
   - MENU SELECTION
   - QUESTION AND ANSWER
   - FORM-FILLING

2. CODING OF INFORMATION ON SDT DISPLAYS CONSISTENT WITH CURRENT GUIDELINES FOR HUMAN-COMPUTER INTERACTION

MODES OF OPERATION

- SIGN-ON/STATUS CHECK
- SELECT/EXAMINE DATA
- INPUT DATA
- MODIFY DATA (ADD DELETE INSERT)
- OUTPUT DATA

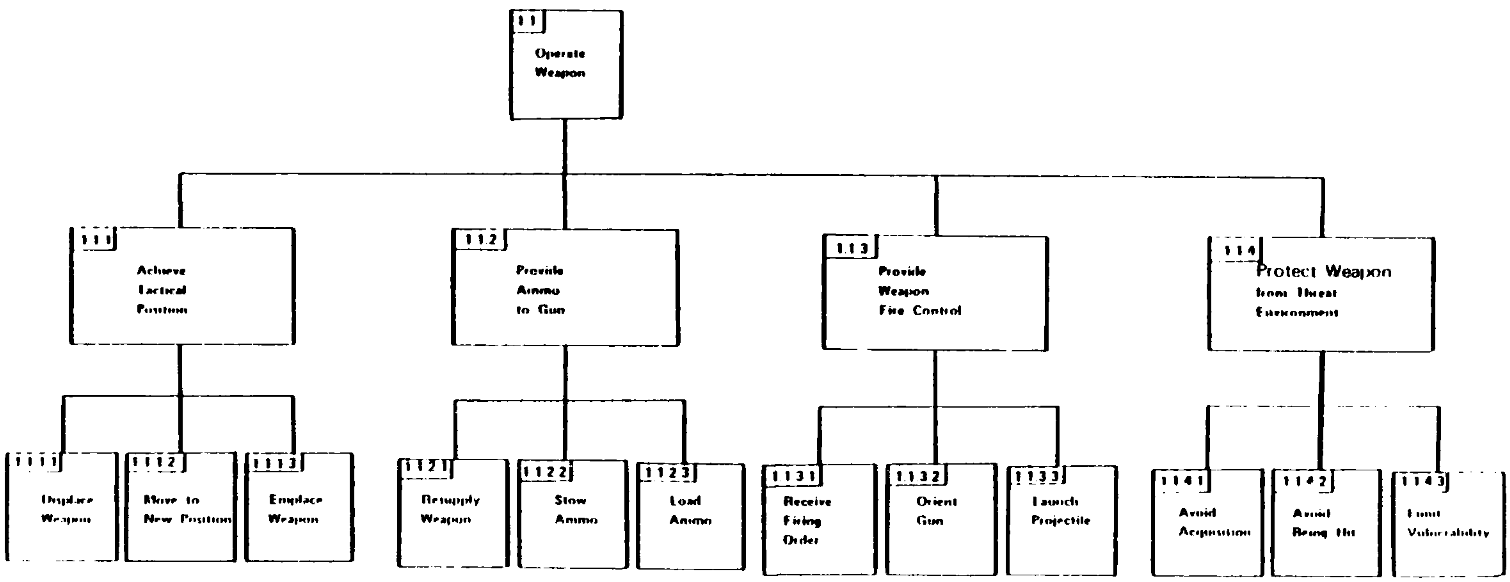
*RUN

OUTPUT REPORT # 12

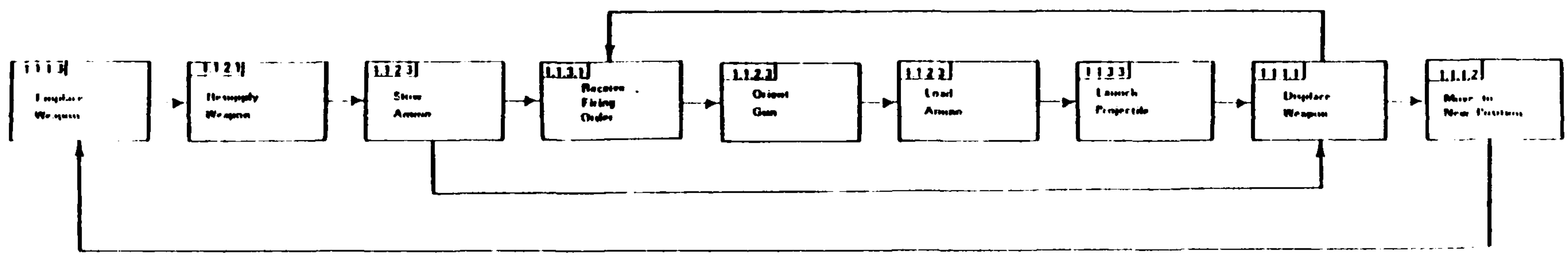
OPERATOR / MAINTAINER TASKS BY EQUIPMENT

ALT NO	ALT	EQUIP NO	EQUIPMENT	TASK TYPE	TASK NO.	TASK
1	ESPH	1.1	GUN	OPERATOR	1.1-1	LOAD GUN
1	ESPH	1.1	GUN	OPERATOR	1.1-2	AIM GUN
1	ESPH	1.1	GUN	OPERATOR	1.1-3	SHOOT GUN
1	ESPH	1.1	GUN	OPERATOR	1.1-4	CLEAN CHAMBER
1	ESPH	1.1	GUN	PM-OPER.	1.1-5	LUBRICATE GUN

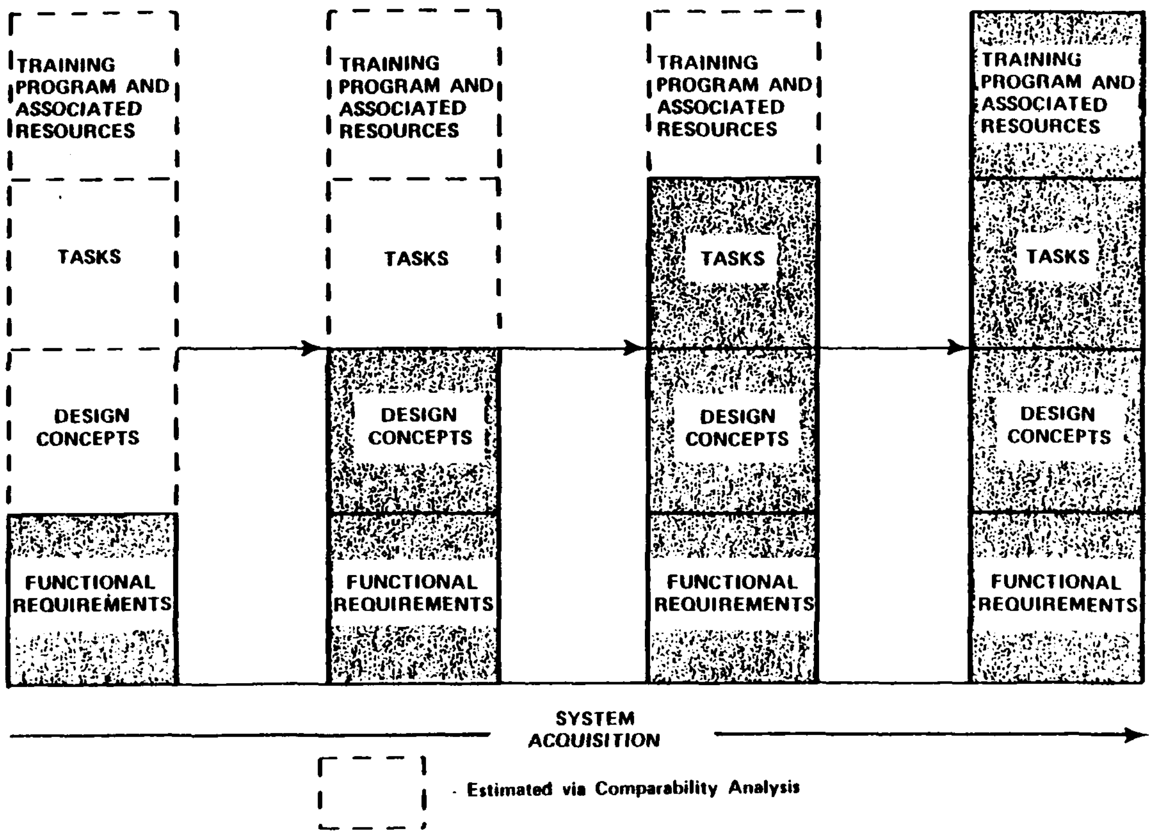
EXAMPLE OF HIERARCHICAL REPRESENTATION



EXAMPLE OF SEQUENTIAL FLOW REPRESENTATION

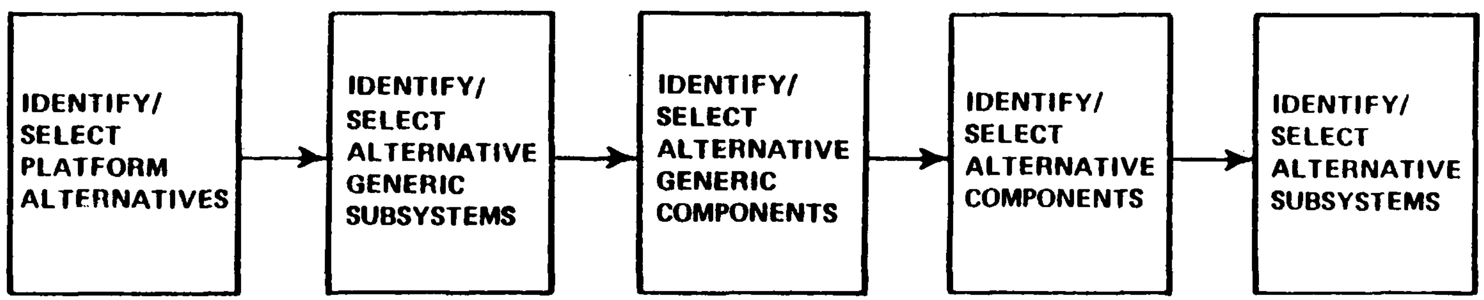


SYSTEM DEVELOPMENT PROCESS FOR SDT

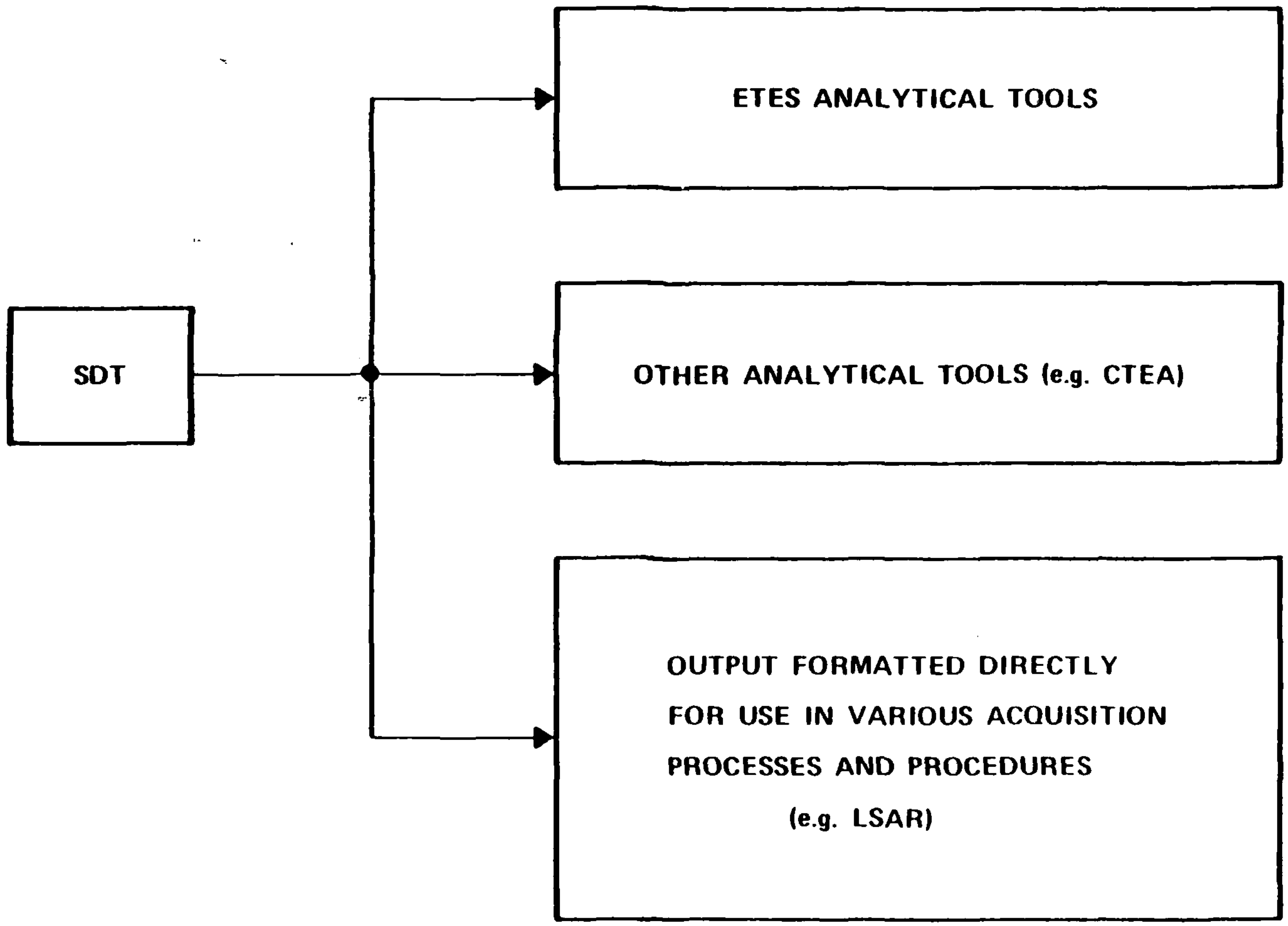


DRC

SEQUENCE FOR IDENTIFYING DESIGN ALTERNATIVES



USES OF SDT



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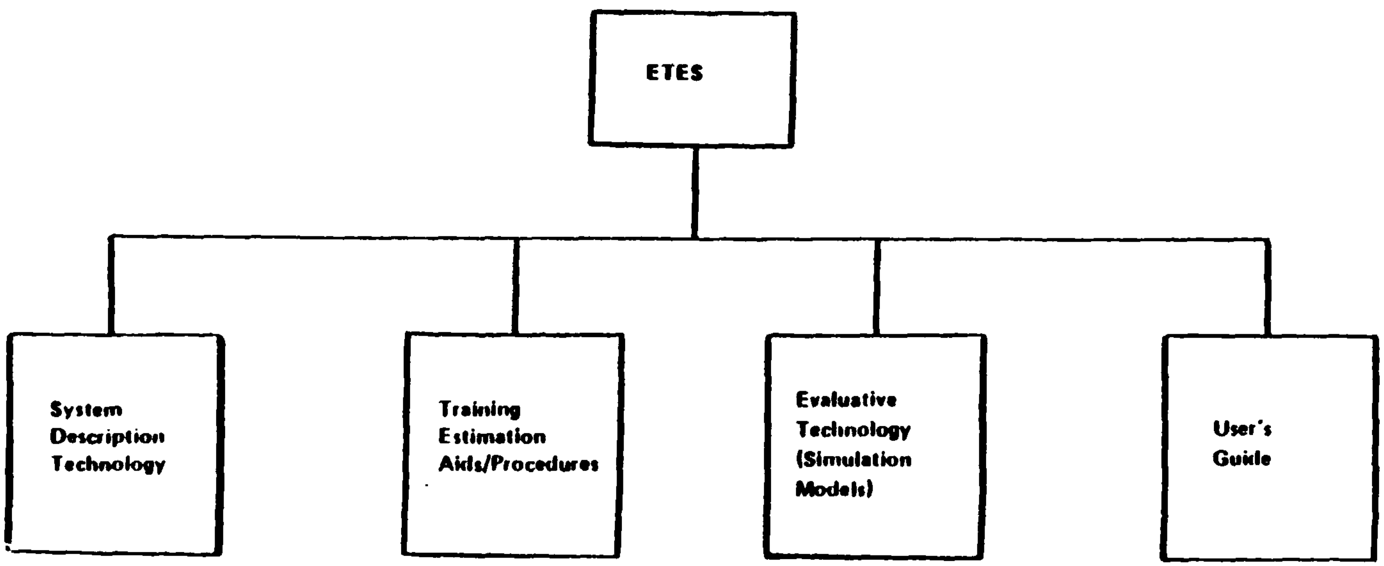
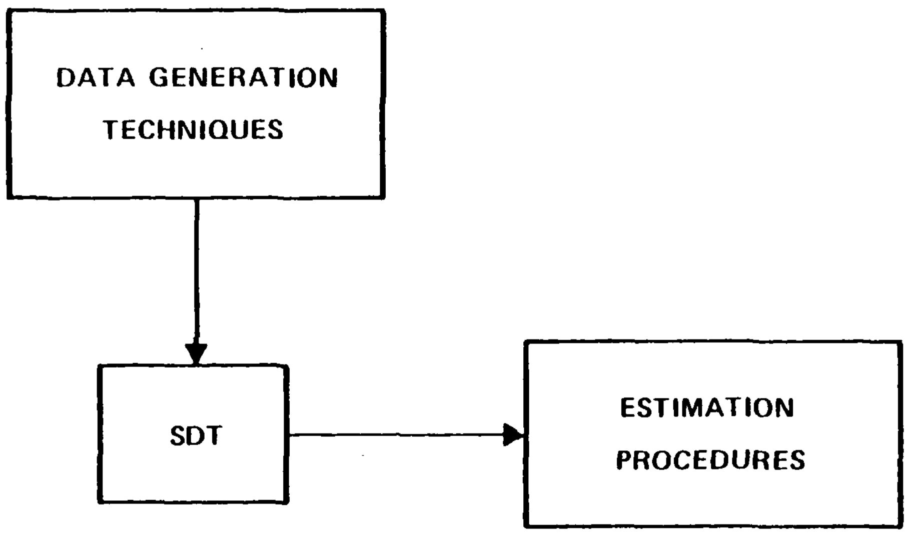
ETES COMPONENTS



TRAINING ESTIMATION AIDS/PROCEDURES



- MOS/ASI ASSIGNMENTS
- SKILL LEVEL ASSIGNMENTS
- TRAINING SETTING ASSIGNMENTS
- METHODS/MEDIA ASSIGNMENTS
- RESOURCE ESTIMATION
- COST ESTIMATION

DRC

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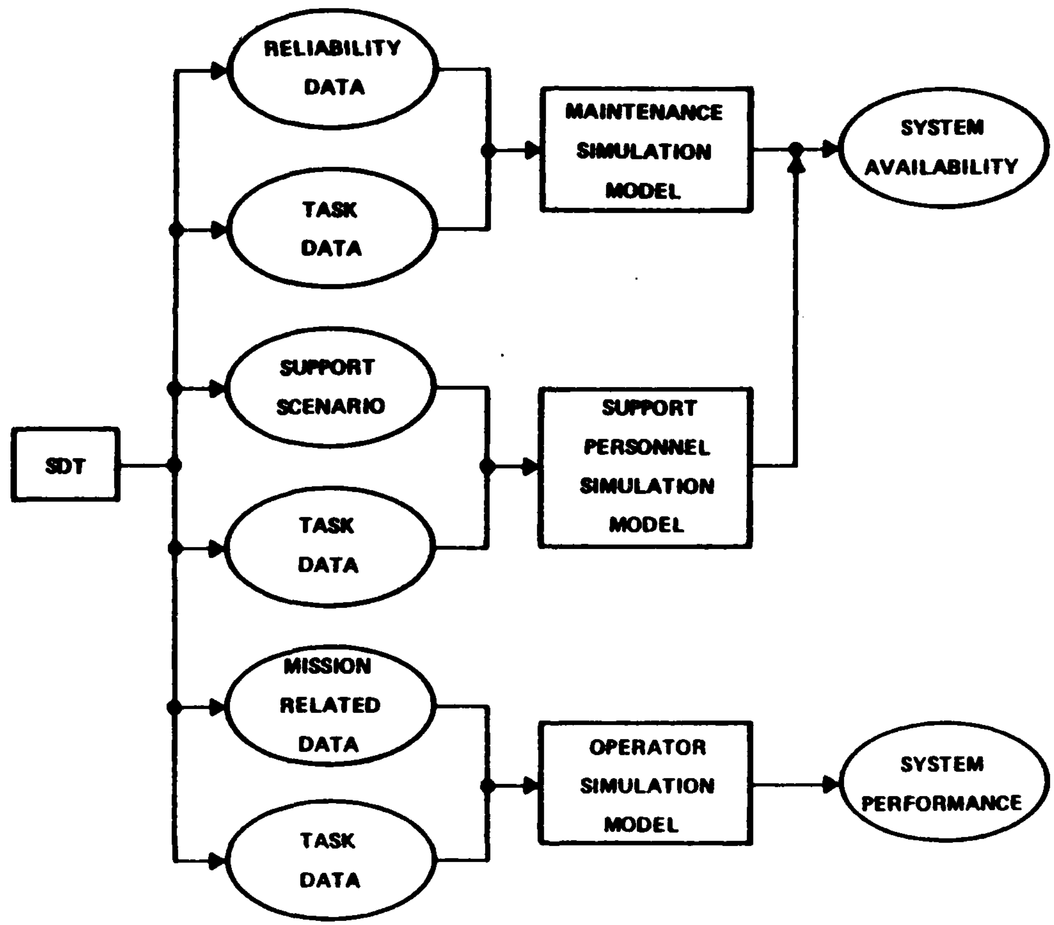
SIMULATION MODELS



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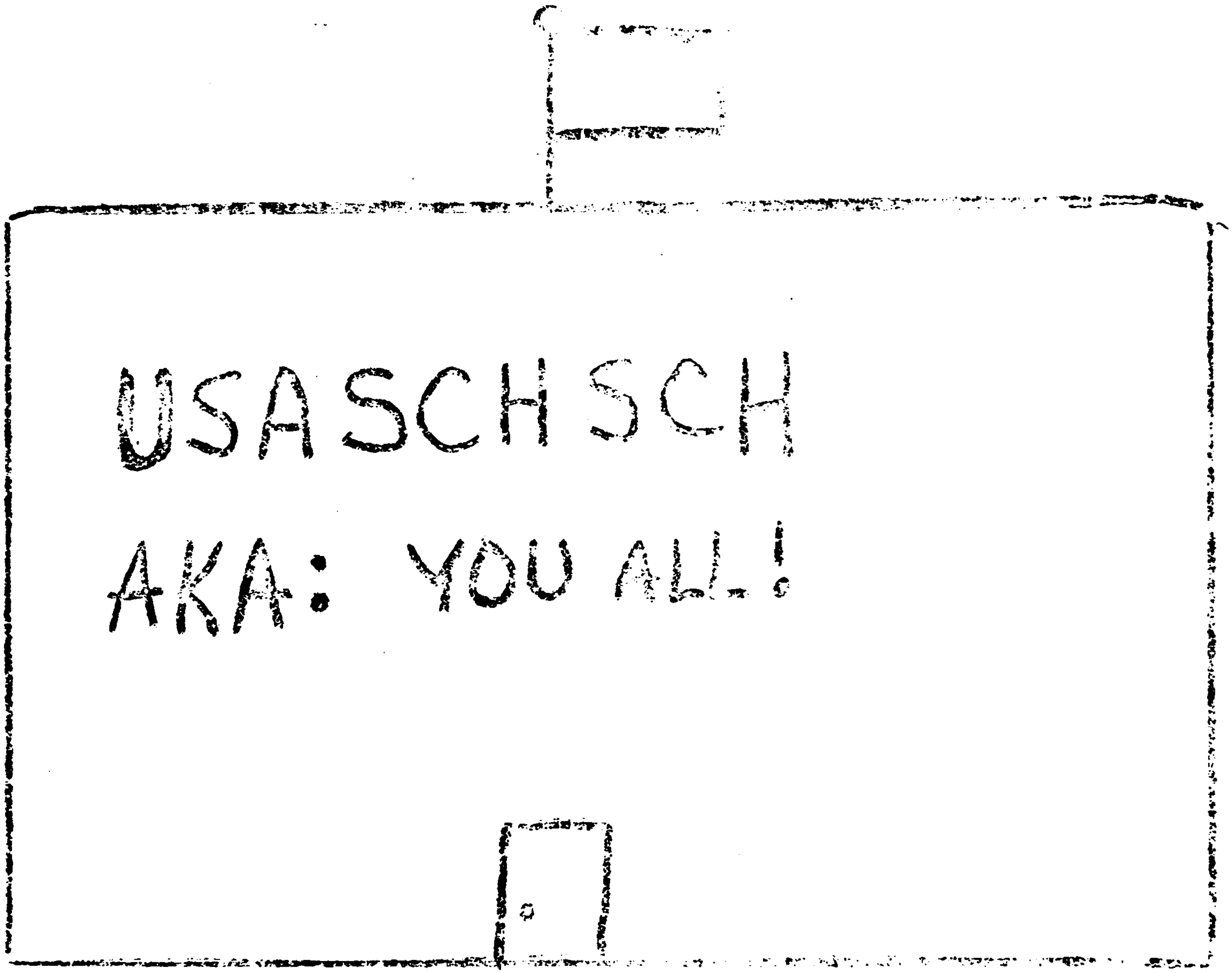
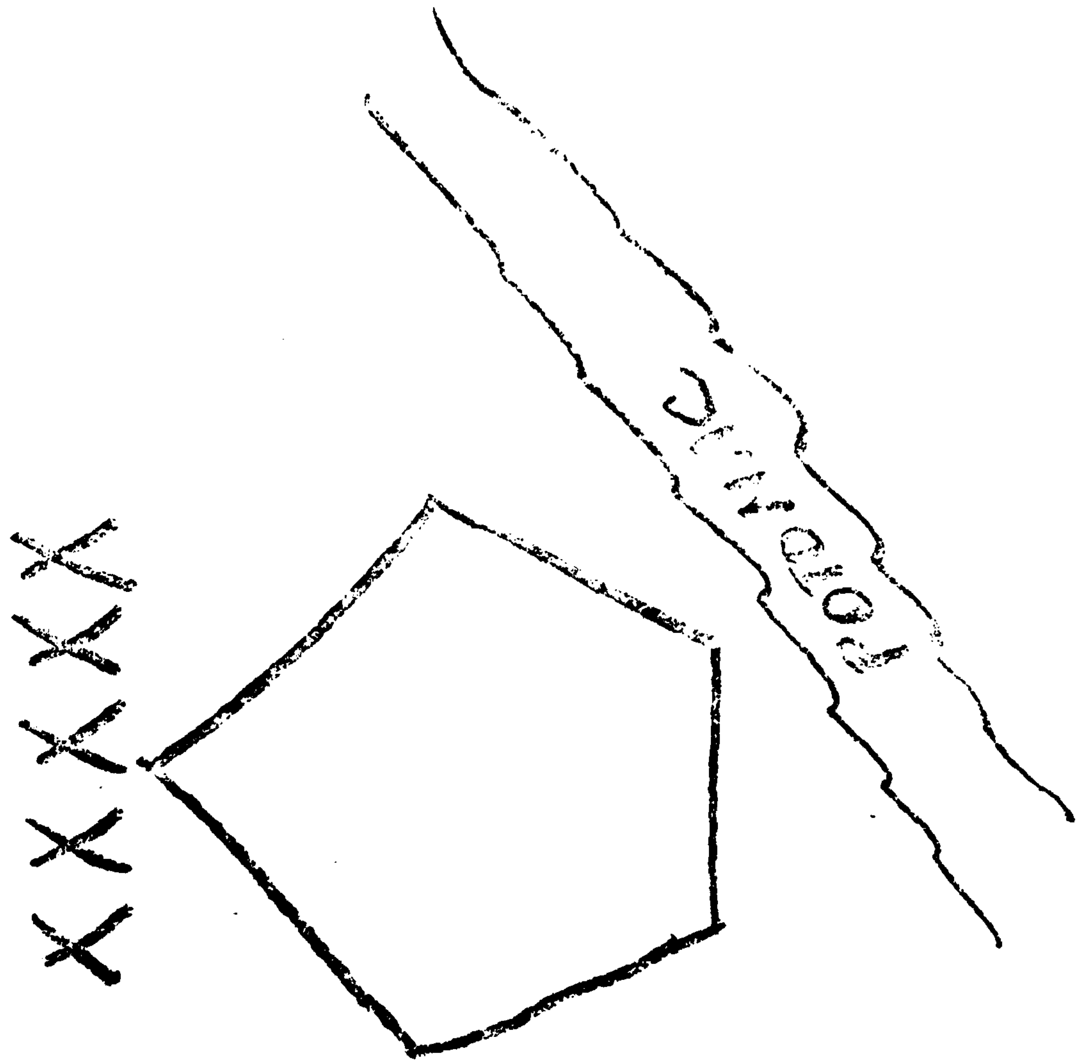
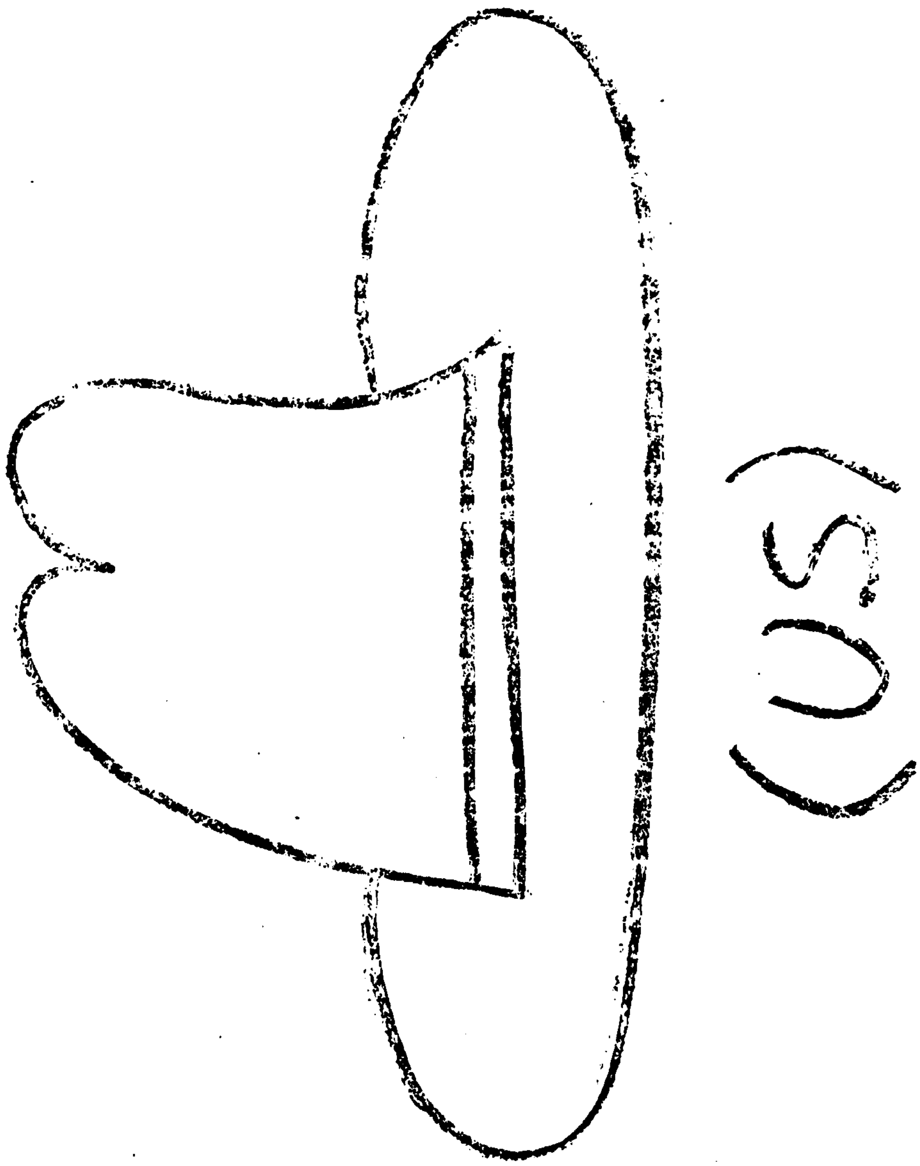
SUMMARY

PROBLEM AREA	ETES COMPONENT
INFORMATION FLOW	SDT
ESTIMATION TOOLS	•ESTIMATION AIDS/PROCEDURES •SIMULATION MODELS


USASCH SCH
AKA: YOU ALL!


POTOMAC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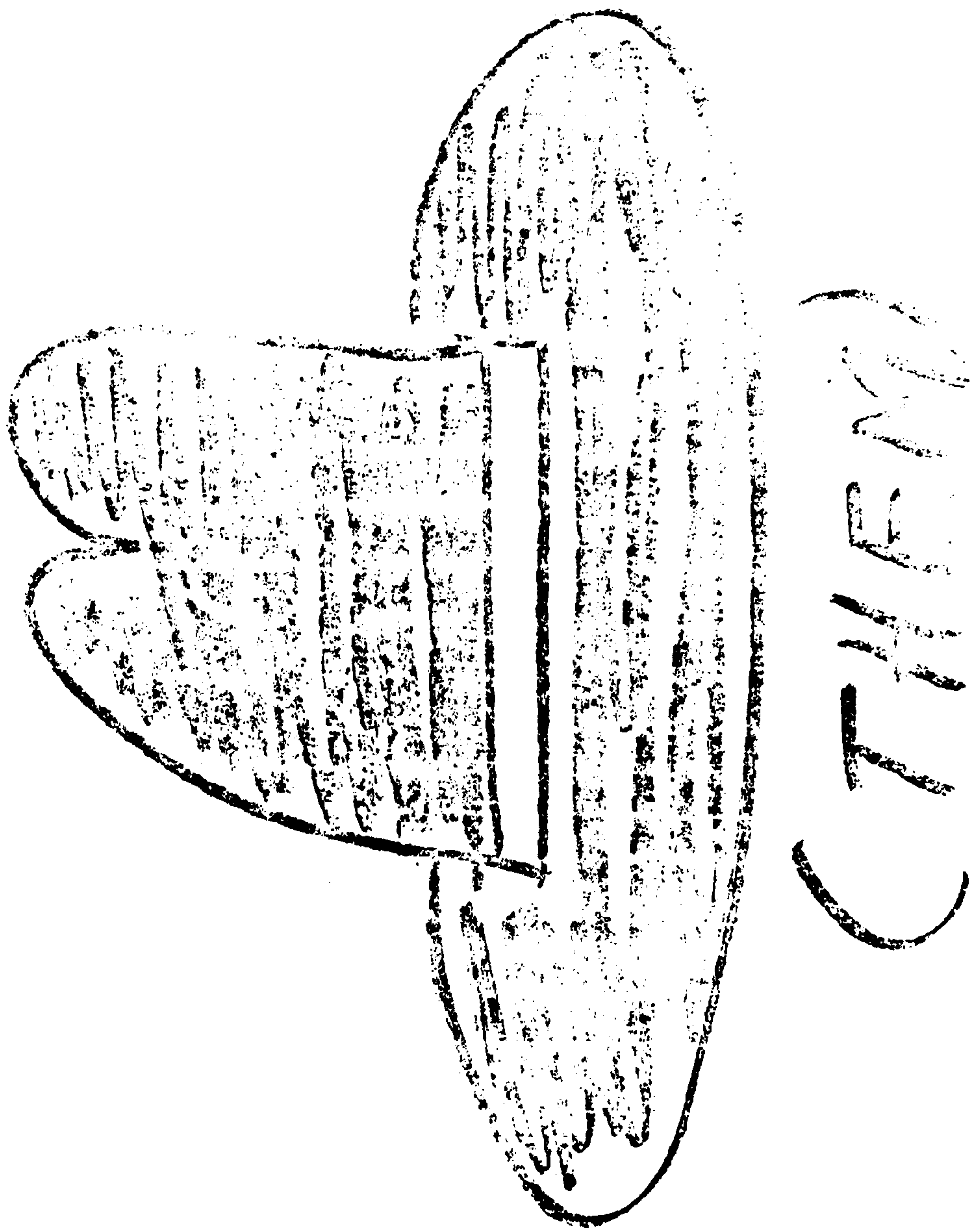
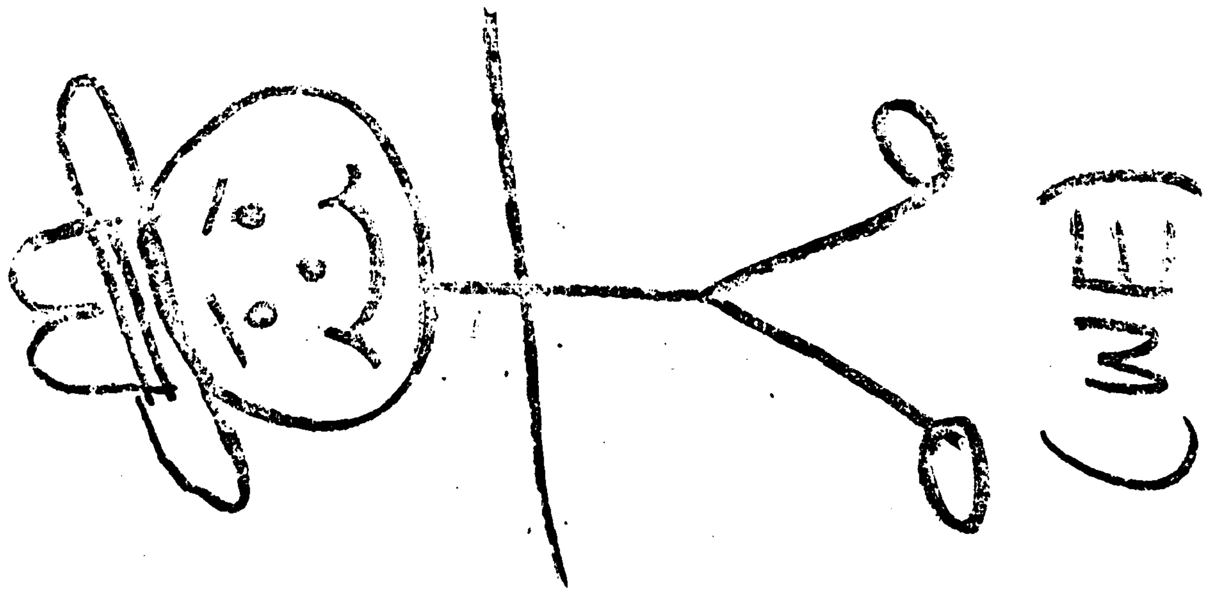
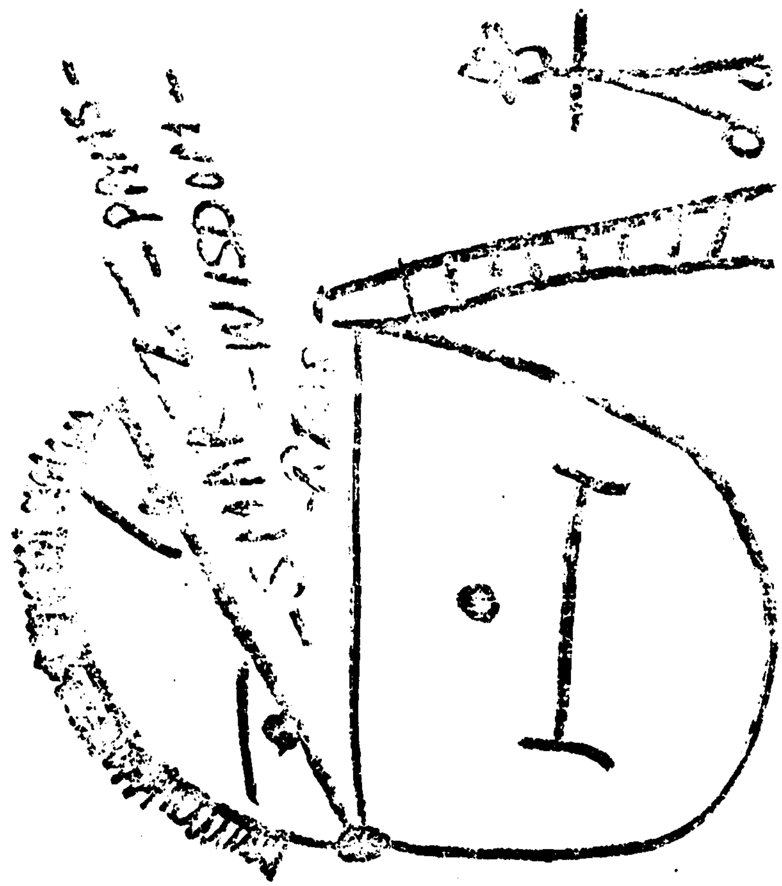
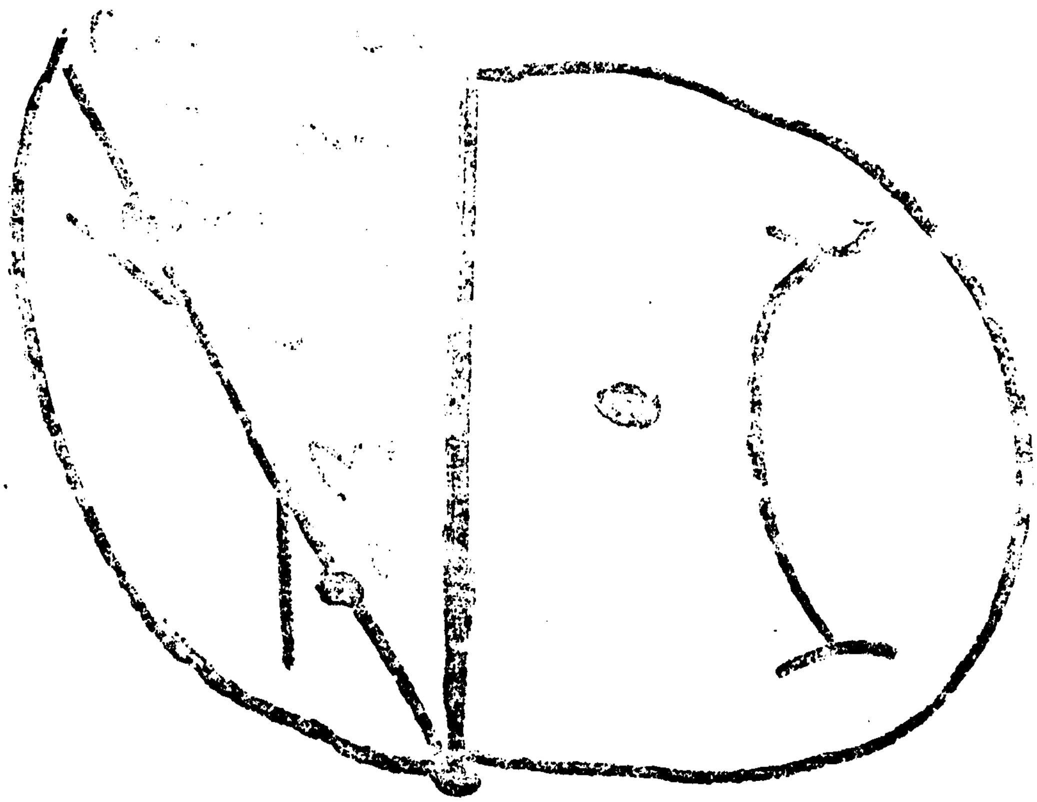
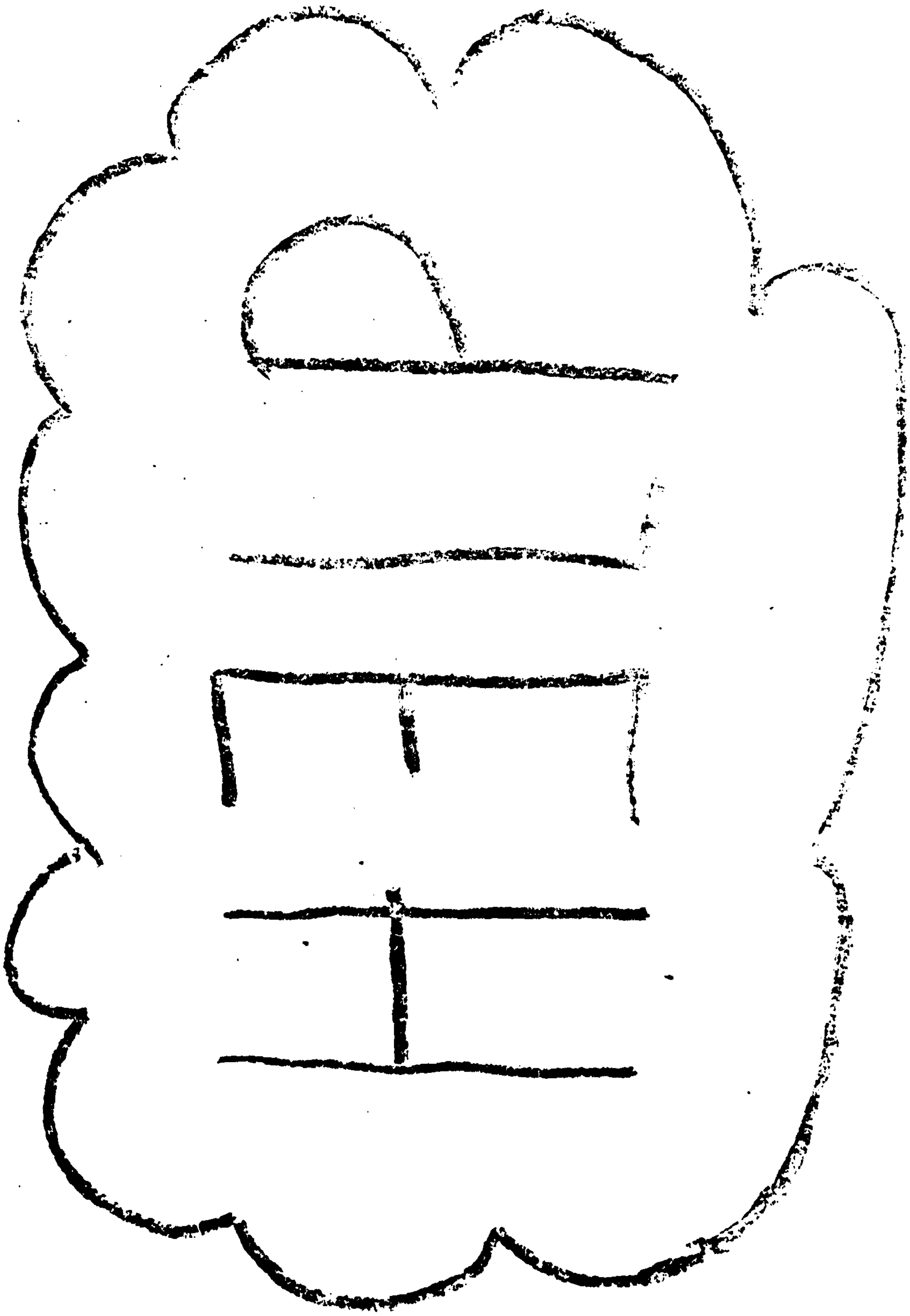
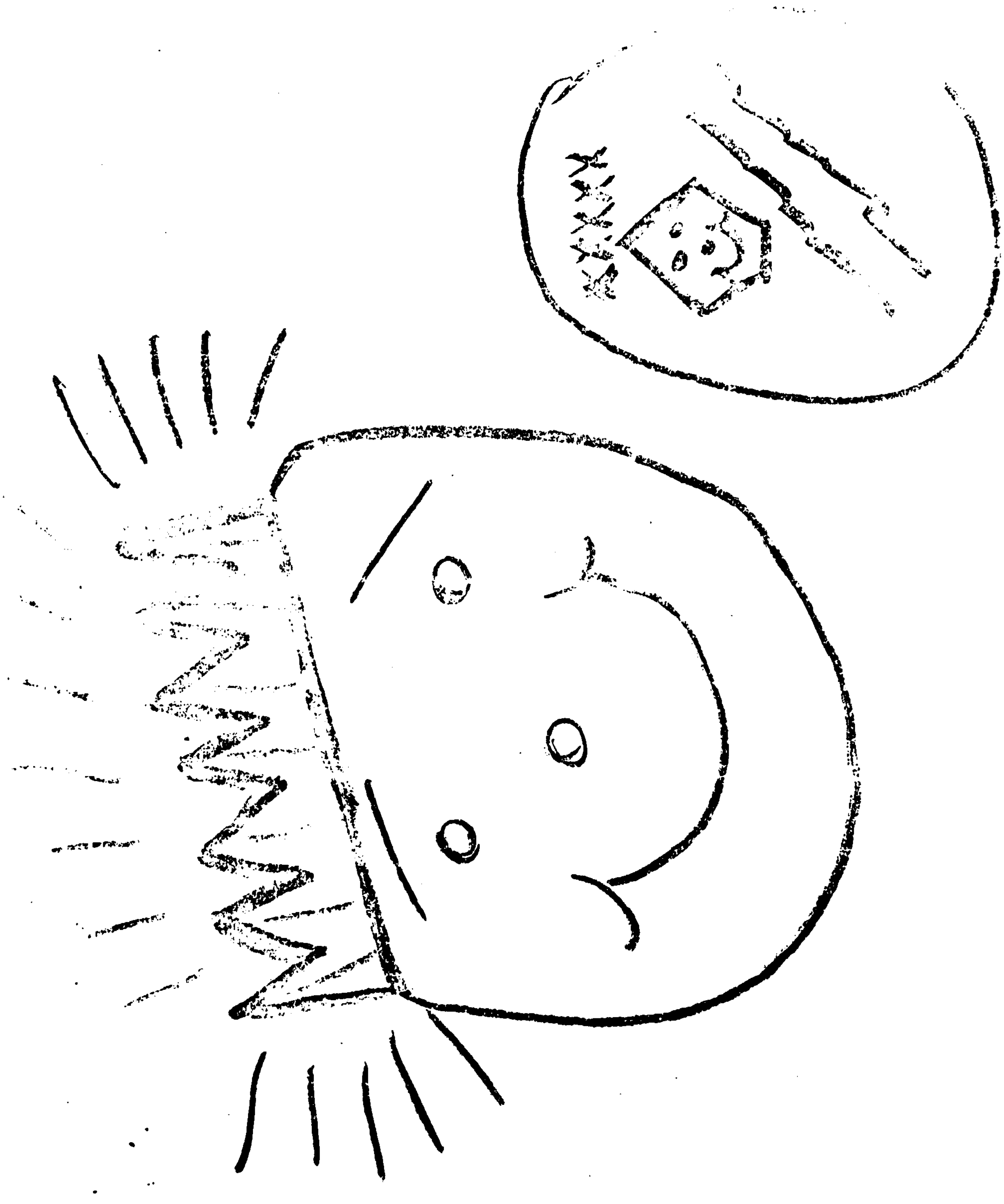

THEM

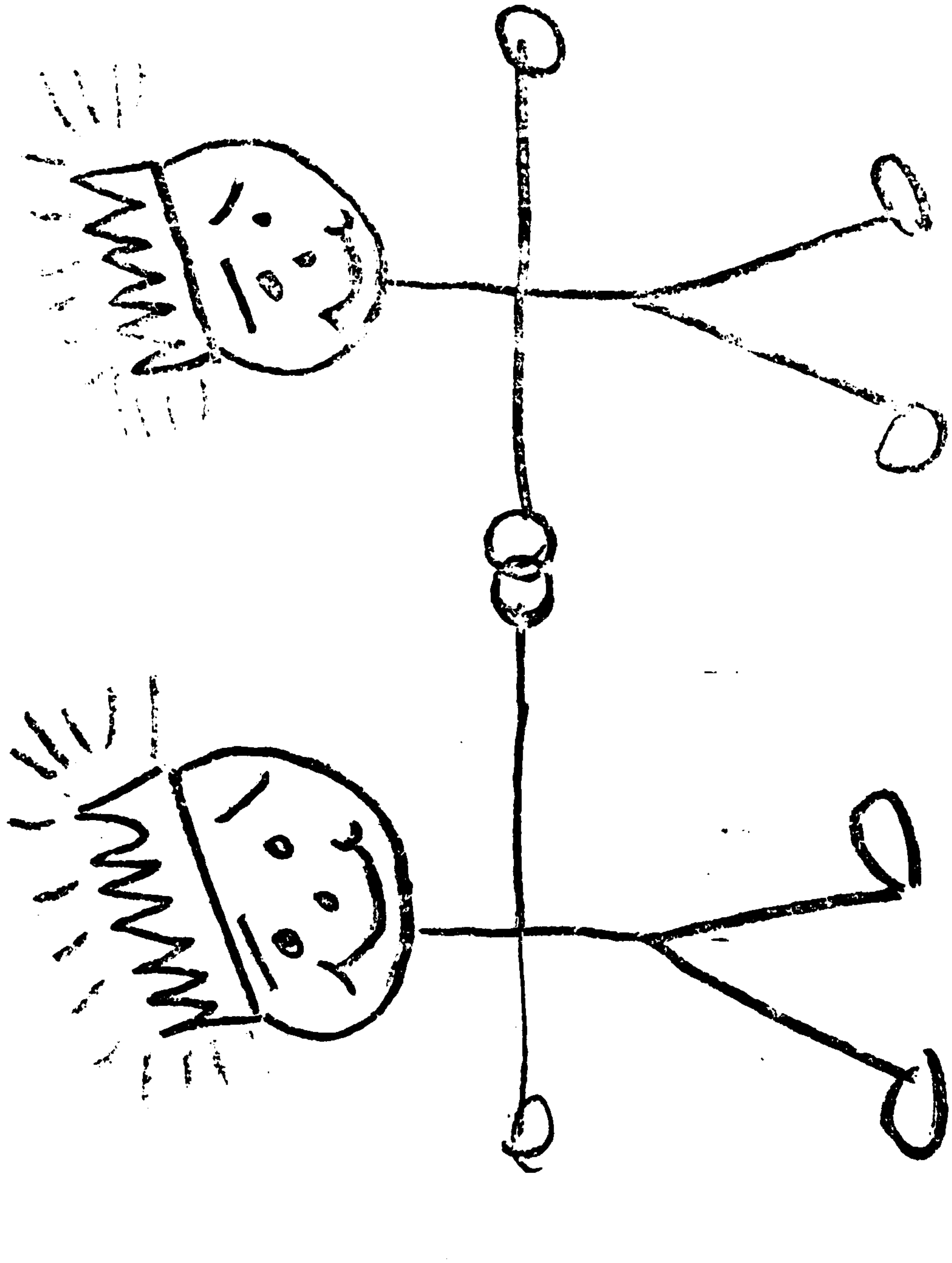

(ME)

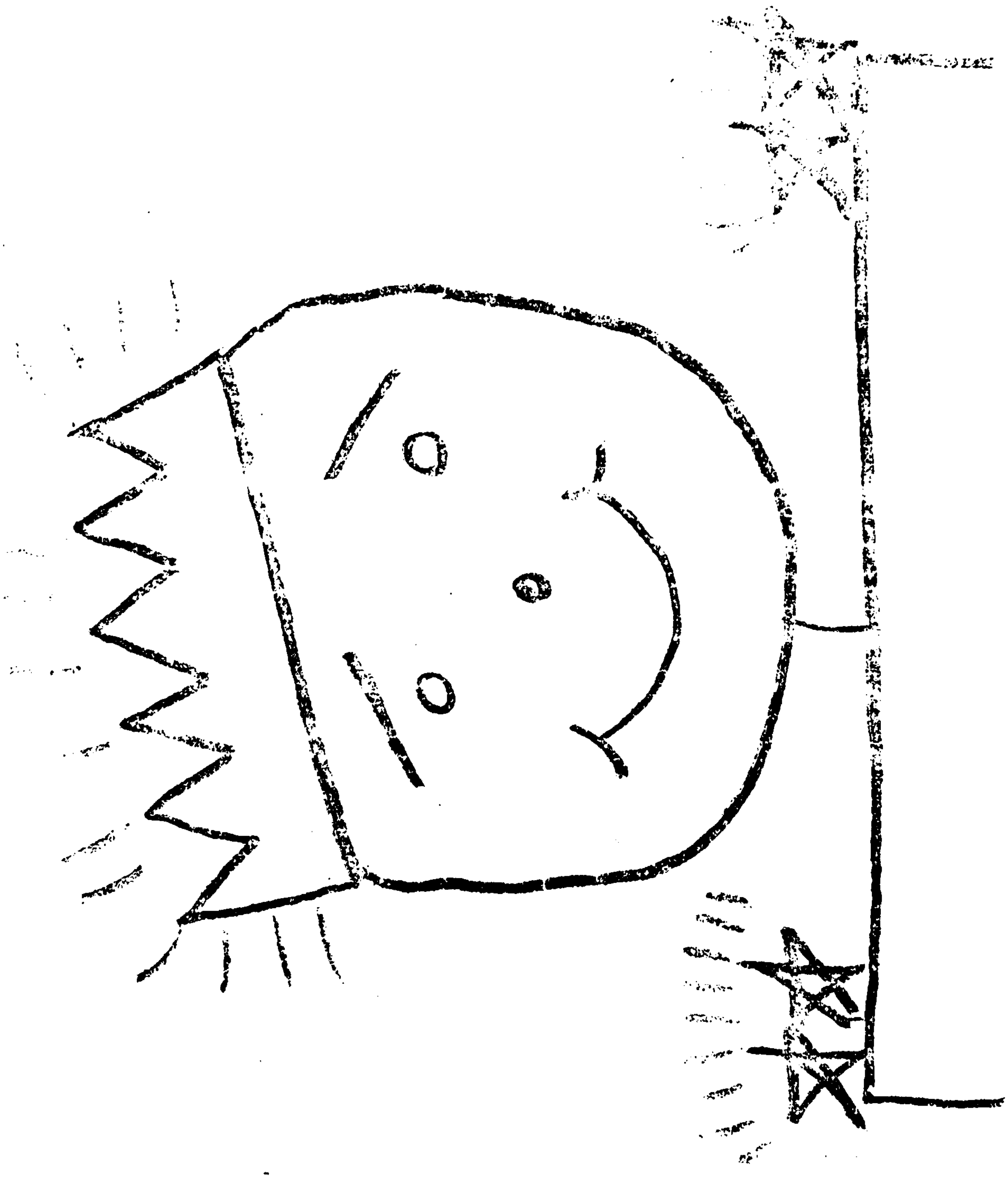




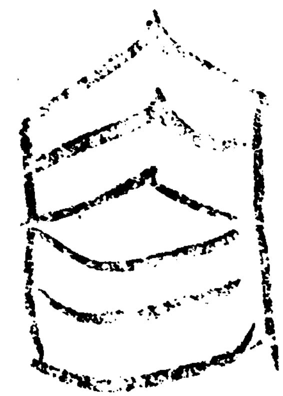

HELP







THAT'S
ALL,
FOLKS!



EXECUTIVE OVERVIEW

DIRECTORATE OF TRAINING DEVELOPMENTS

US ARMY FIELD ARTILLERY SCHOOL

for

CHIEFS OF ANALYSIS SEMINAR

21-23 October 1981

Virginia Beach, VA

POC: Taft M. Joseph, Jr.
Chief, Analysis
US Army Field Artillery School
Fort Sill, OK 73503
Telephone: (AV) 639-3092

EXECUTIVE OVERVIEW

PART I

INTRODUCTION: (SL #1 ATTACHED)

THIS BRIEFING HAS BEEN DESIGNED TO PRESENT THE FIELD ARTILLERY SCHOOL'S STATUS CONCERNING FRONT END ANALYSIS AS IT PERTAINS TO THE DEVELOPMENT OF QUALITY INSTRUCTIONAL DEVELOPMENT PROGRAMS AND ASSOCIATED TRAINING PRODUCTS. THE ORGANIZATION REQUIRED TO PERFORM ANALYSIS ACTIVITIES, THE METHODOLOGY UTILIZED, MAJOR ACCOMPLISHMENTS, AND COMPUTERIZATION WILL BE ADDRESSED. ADDITIONALLY, TRAINING ANALYSIS AS IT RELATES SPECIFICALLY TO NEW DEVELOPING SYSTEMS WILL ALSO BE PRESENTED. THIS PORTION WILL COVER THE CONVERSION OF LOGISTICAL SUPPORT ANALYSIS RECORD (LSAR) TYPE DATA INTO RECOGNIZABLE INDIVIDUAL TASKS AS CURRENTLY DEFINED IN TRADOC TRAINING DEVELOPMENT DOCUMENTS. THE RATIONALE, METHODOLOGY AND ITS INCLUSION INTO A TRAINING DEVELOPMENT TYPE STATEMENT OF WORK THAT CAN BE SATISFACTORILY UTILIZED BY CONTRACTORS, TO INCLUDE SYSTEMS, WILL BE DISCUSSED.

ORGANIZATION: (SL #2-7 ATTACHED)

AFTER USAFAS WAS DESIGNATED A REVIEW OF EDUCATION AND TRAINING FOR OFFICERS (RETO) PILOT SCHOOL, THE OPPORTUNITY AROSE TO CONDUCT JOB/TASK ANALYSIS FOR FA OFFICERS. AFTER CLOSE SCRUTINY OF THE METHODOLOGY WE DESIRED TO USE, IT WAS OBVIOUS THAT A SOLID ANALYSIS BASE OF THE FA ENLISTED OCCUPATIONAL SPECIALTIES WOULD BE REQUIRED IF WE DESIRED AN EFFECTIVE TRAINING OUTPUT. AN ORGANIZATION WAS FORMED OF INDIVIDUALS THAT WERE CAPABLE OF CONDUCTING ANALYSIS FOR ENLISTED MOS, WARRANT MOS, AND OFFICER SPECIALTY AREAS. THE ANALYSTS ASSOCIATED WITH THIS AREA ARE ALL MILITARY AND ARE FORMED INTO THREE FUNCTIONAL BRANCHES COVERING THE MISSILE/ROCKET, THE CANNON, AND THE TARGET ACQUISITION SPECIALTY AREAS. THE NEW SYSTEMS BRANCH CONCENTRATES ON NEW DEVELOPING SYSTEMS AND IS RESPONSIBLE FOR

INSURING THAT TRAINING ANALYSIS AND PRODUCTS, AND INSTRUCTION PARALLELS THE DEVELOPMENT OF THE HARDWARE. DETAILS OF THESE PROCEDURES WILL BE COVERED LATER. THE ANALYSIS COORDINATOR, A CIVILIAN, IS RESPONSIBLE TO INSURE THE STANDARDIZATION OF ANALYSIS PROCEDURES AND ALSO IS RESPONSIBLE FOR THE AUDIT TRAIL FILES. THE RETO COORDINATOR, A MILITARY POSITION, IS RESPONSIBLE FOR THE COORDINATION AND IMPLEMENTATION OF THE RETO OBJECTIVES. THE BSEP COORDINATOR IS RESPONSIBLE FOR THE COORDINATION AND IMPLEMENTATION OF THE BSEP PROGRAM. THE COMPUTER SPECIALIST WILL CONTROL COMPUTER RELATED EQUIPMENT, MANAGE AND RECOMMEND CHANGES TO PROGRAMS.

<u>FEA METHODOLOGY</u>: (SL #7 ATTACHED)

THIS DIAGRAM DISPLAYS HOW WE WOULD LIKE TO CONDUCT TRAINING ANALYSIS. ONCE THE MISSIONS AND ARTEP/COLLECTIVE TASKS OF AN ORGANIZATION ARE IDENTIFIED, WE CAN IDENTIFY THE INDIVIDUAL TASKS OF THE ASSIGNED JOBS (TOE/TDA). THIS "WHAT SHOULD BE" INSTITUTIONAL IDENTIFIED INFORMATION IS THEN COMPARED TO THE "WHAT IS" DATA ACQUIRED THROUGH THE USE OF QUESTIONNAIRES/SURVEYS ADMINISTERED TO THE JOB INCUMBENTS USING CODAP AND INTERNALLY DEVELOPED SCALES. PROPOSED DEGREE OF TRAINING AND SITE SELECTION IS DERIVED FROM DECISION TREE TYPE MODELS USING THE COLLECTED DATA. THE PROPOSED TASKS, DEGREE OF TRAINING, AND SITE SELECTION INFORMATION IS THEN PRESENTED TO A FORMAL BOARD CONSISTING OF THOSE OFFICERS RESPONSIBLE FOR DEVELOPING AND IMPLEMENTING INSTRUCTION AND THOSE RESPONSIBLE FOR TRAINING PRODUCTS. THESE 05/06 GRADE OFFICERS ARE NORMALLY ACCOMPANIED BY THEIR SMEs. THIS APPROVED DOCUMENT PROVIDES ALL PARTIES INVOLVED IN THE MANY ASPECTS OF TRAINING A COMMON AGREED UPON ANALYSIS BASE FROM WHICH TO CONDUCT THEIR RESPECTIVE ACTIVITIES. THIS DOCUMENT ALSO PROVIDES THE BASIS OF THE

RATIONALE TO DEVELOP THE COMMANDANT'S TRAINING STRATEGY AND THE INDIVIDUAL TRAINING PLAN PROPOSAL (ITPP). ALL OF THE OUTPUTS SHOWN SHOULD BE DEVELOPED FROM THIS COMMON ANALYSIS BASE.

COMPUTERIZATION: (SL #8-11 ATTACHED)

WE ARE CURRENTLY PROCEEDING TO TOTAL COMPUTERIZATION OF OUR FEA PROGRAM. THIS EFFORT THAT WE CALL CSAT (COMPUTERIZED SYSTEMS APPROACH TO TRAINING) WILL ALLOW US TO CONDUCT FEA FOR FA SYSTEMS NOW AND IN THE FUTURE WITH A GREAT AMOUNT OF EFFICIENCY, AND WILL ALLOW THE PROCESS TO BE AFFORDABLE. THE ACCURATE AND READILY ATTAINABLE AUDIT TRAIL WE WILL HAVE WILL PROVIDE STANDARDIZATION AND INFORMATION MANAGEMENT THAT WILL BE INDISPENSABLE ESPECIALLY FOR NEW SYSTEMS THAT TRANSCEND OVER MANY FISCAL YEARS BEFORE FIELDING. THE INITIAL PROGRAMS DEVELOPED WILL COVER THE AREAS OF THE LIFE CYCLE MANAGEMENT MODEL THAT ARE PERTINENT TO TRAINING DEVELOPMENTS, MANAGEMENT OF TASKS AND TASK INFORMATION, FEA SURVEY/ QUESTIONNAIRE CONSTRUCTION, AND DATA COMPUTATION. OTHER FUTURE ADDITIONS WILL COVER THE AREAS OF COST TRAINING EFFECTIVENESS ANALYSIS AND INTERFACE PROGRAMS WITH OUR CURRENT WORD PROCESSING EQUIPMENT.

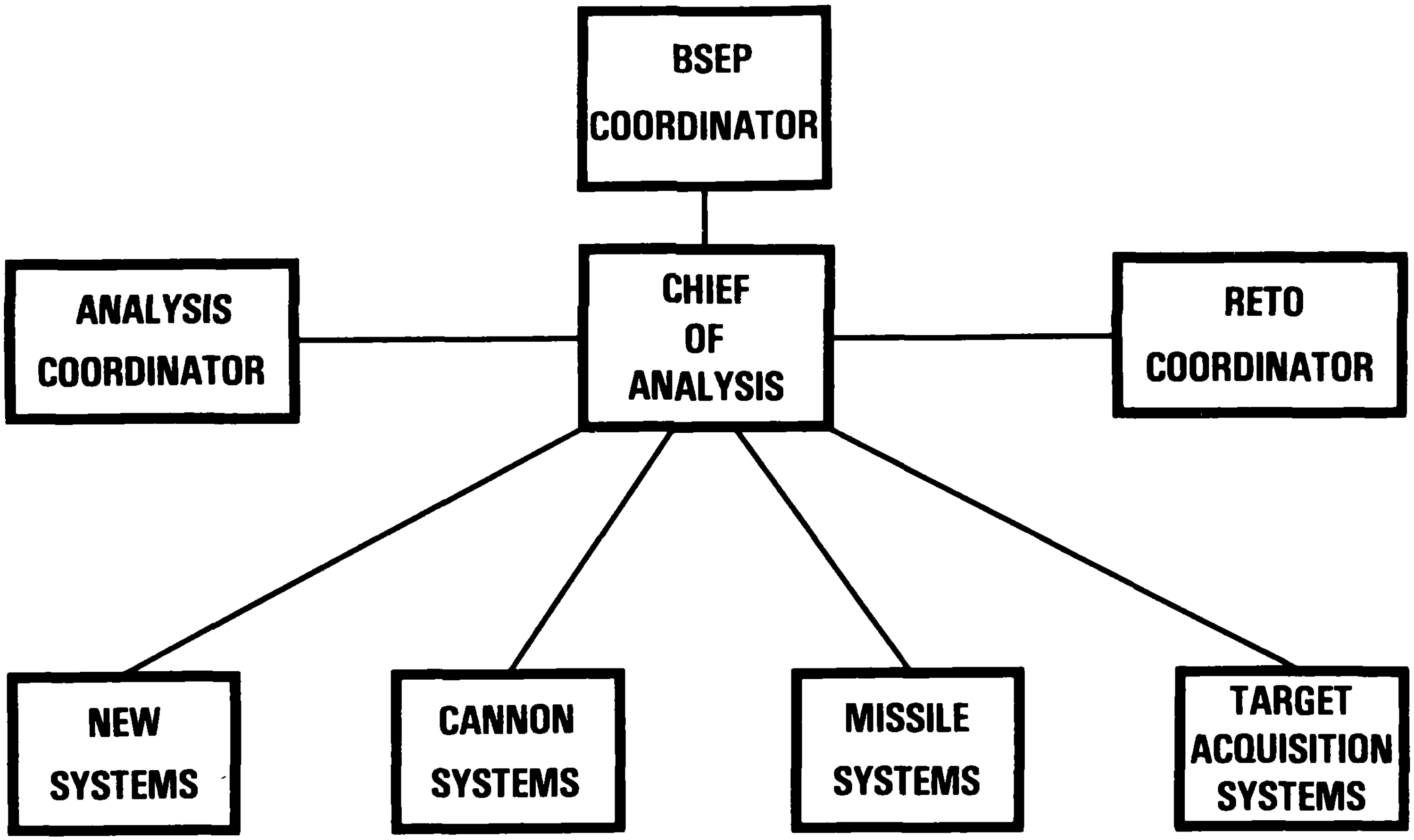
PART I, ATTACHED SLIDES, EXECUTIVE OVERVIEW

SLIDE	1	USAFAS
SLIDE	2	ORGANIZATION
SLIDE	3	MISSIONS
SLIDE	4-5	MOS REANALYSIS
SLIDE	6	RETO
SLIDE	7	FEA DIAGRAM
SLIDE	8-11	CSAT

US ARMY FIELD ARTILLERY SCHOOL

CEDAT FORTUNA PERITIS

ANALYSIS DIVISION



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ANALYSIS MISSION

CONDUCT IFEA FOR DEVELOPING NEW SYSTEMS AND EXISTING SYSTEMS

- IFEA PLAN DEVELOPMENT
- MANAGEMENT OF AUDIT TRAIL FROM BEGINNING OF LIFE CYCLE
- INTERFACE WITH COMBAT DEVELOPER AND CONTRACTOR
- DEVELOP AND IMPLEMENT ANALYSIS PROCEDURES
- ORCHESTRATE TASK/SITE SELECTION BOARDS
- DEVELOP TRAINING TEST SUPPORT PACKAGE (TTSP) FOR NEW SYSTEMS

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MOS REANALYSIS STATUS

IFEA INITIATED NOV 79

COMPLETION TARGET DATE AUG 81

MOS	SME BOARD	SR. REVIEW BD.
13F	8 JAN 81	13 JAN 81
21G	12 JAN 81	16 JAN 81
13F DMD/VFMD	20 FEB 81	5 MAR 81
15J	23 FEB 81	9 MAR 81
13F GLLD	24 FEB 81	5 MAR 81
15D	25 FEB 81	13 MAR 81
13E	28 APR 81	5 MAY 81
15E	5 MAY 81	19 MAY 81
13B	7 MAY 81	14 MAY 81

MOS REANALYSIS STATUS

IFEA INITIATED NOV 79

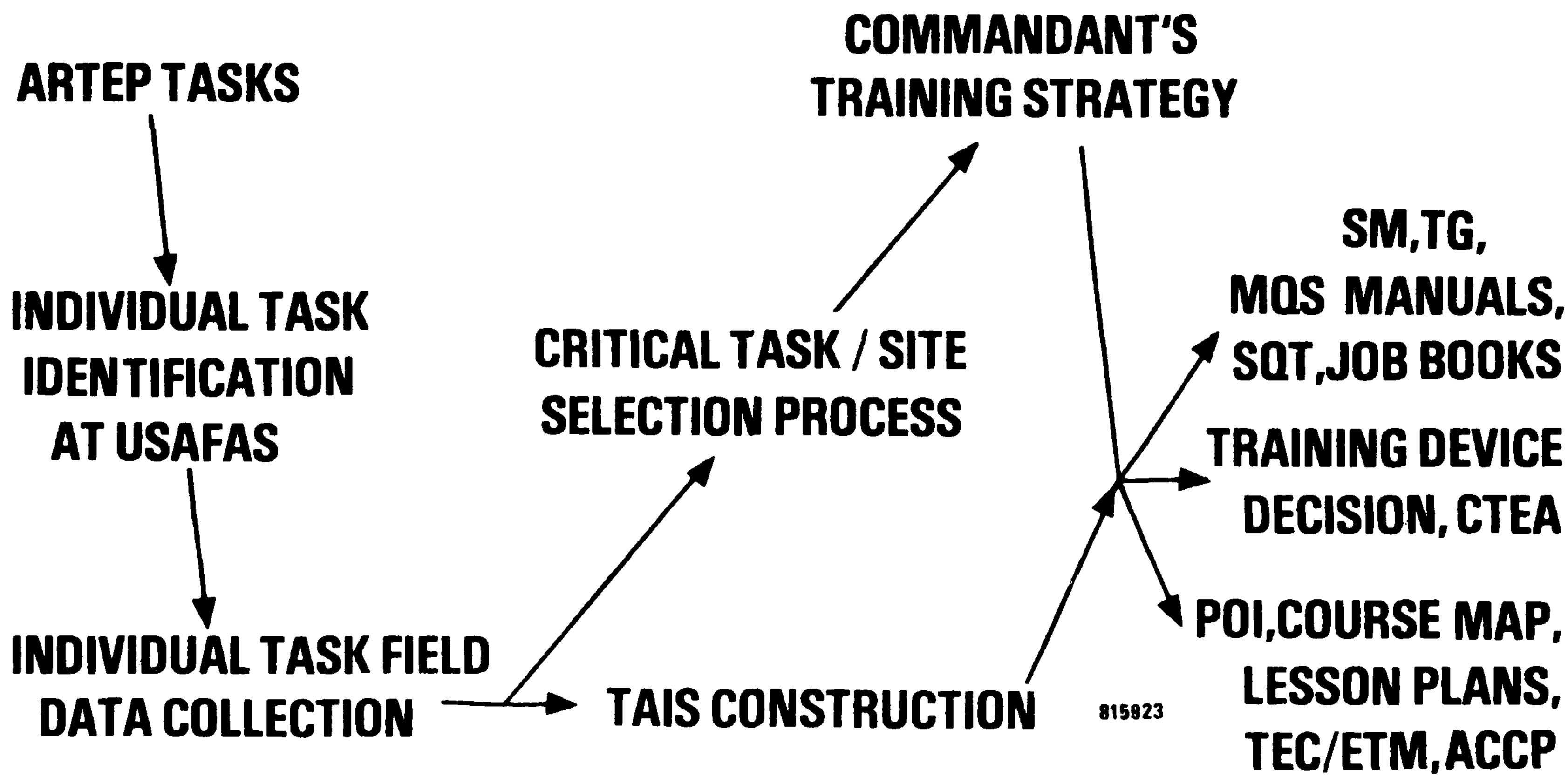
COMPLETION TARGET DATE AUG 81

MOS	SME BOARD	SR. REVIEW BD.
21G	12 MAY 81	26 MAY 81
13R	28 MAY 81	4 JUN 81
82C	11 JUN 81	18 JUN 81
17B	23 JUN 81	30 JUN 81
17C	9 JUL 81	16 JUL 81
93F	3 AUG 81	3 AUG 81
26B	3 NOV 81	3 NOV 81
13C	1 APR 82	1 APR 82

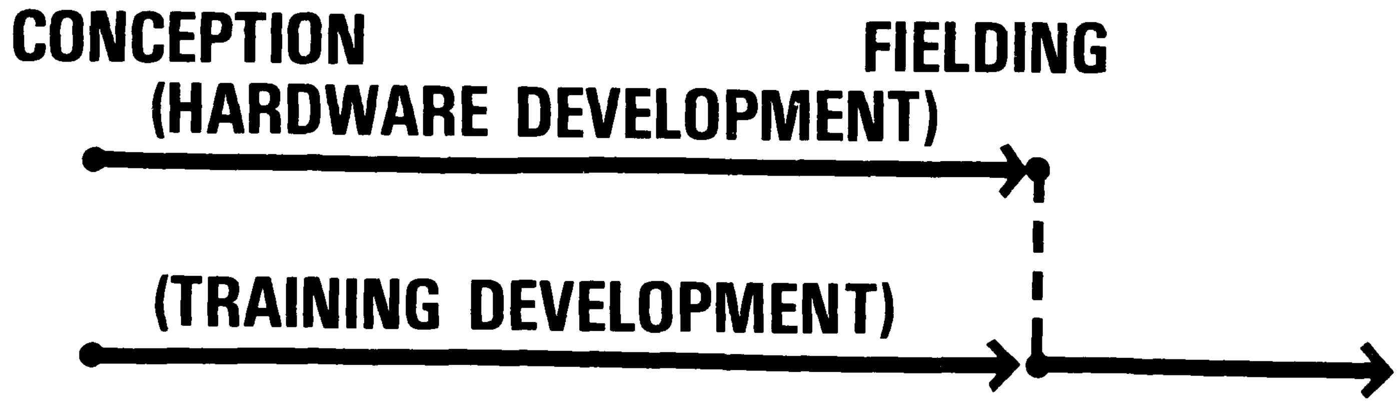
RETO ANALYSIS/PRODUCT STATUS

COMPANY GRADE OFFICERS	ANALYSIS BEGAN	STRATEGY SUBMISSION	MANUAL DEV.
LIEUTENANTS	1 JAN 79	15 NOV 80	7 DEC 81 (MQS II)
CAPTAINS	1 JAN 79	1 MAY 81	1 APR 82 (MQS III)
WARRANT OFFICERS			
214E-0 (PERSHING)	1 JAN 79	1 JAN 82	1 JAN 82
214G-0 (LANCE)	1 APR 80	1 APR 84	1 JUL 85
211A-0 (RADAR)	1 APR 80	1 APR 84	1 JUL 85
201A-0 (MET)	1 APR 80	1 APR 84	1 JUL 85

TRAINING DEVELOPMENT OUTPUTS FROM COMMON ANALYSIS BASE



NEW SYSTEMS



CONCEPTION
FIELDING
(HARDWARE DEVELOPMENT)
(TRAINING DEVELOPMENT)

MAJOR EFFORTS

- MULTIPLE LAUNCH ROCKET SYSTEM (MLRS)
- PERSHING II (P II)
- REMOTELY PILOTED VEHICLE (RPV)
- FIRE SUPPORT TEAM VEHICLE (FIST V)
- MOS 34Y
- BATTERY COMPUTER SYSTEM (BCS)
- METEOROLOGICAL DATA SYSTEM (MDS)

SOLUTION
CONTRACTOR SUPPORT

SYSTEM/PROGRAM	CONTRACTOR	STATUS
MLRS	VOUGHT	UPDATE
MLRS FIRE DIRECTION SYSTEM	TELOS	ONGOING
P II	MARTIN-MARIETTA	ONGOING
MDS	BENDIX	ONGOING
RPV	LOCKHEED	PENDING (1 OCT 81)
TARGETING CELL	BDM	PENDING
COMPUTER HARDWARE	SCREENING	PENDING
DS/GS MAINTENANCE	CANDIDATES	
MOS 34Y		

COMPUTERIZED

SYSTEMS

APPROACH

TO TRAINING

CSAT BENEFITS

SAVINGS

- PERSONNEL
- TIME
- MONEY

STANDARDIZATION

- TRAINING DEVELOPMENTS

CSAT PROGRAM

DELIVERABLES	1ST YEAR COSTS	2ND YEAR COSTS	DELIVERY
SOFTWARE	*$33,000	$----	1 OCT - 1 DEC 81
ANALYSIS			
DESIGN			
DEVELOPMENT			
IMPLEMENTATION			
EVALUATION			
*INCLUDES CONSULTATION CONTRACT ($10,000) PROPOSED TO COINCIDE WITH SOFTWARE DEVELOPMENT			
HARDWARE	21,000	16,200	1 DEC 81
4 TERMINALS w/PRINTERS			
TOTALS	$54,500	$16,200	

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EXECUTIVE OVERVIEW

PART II

FRONT END ANALYSIS FOR NEW FIELD ARTILLERY SYSTEMS HAS BEEN LIKENED TO

(SLIDE 1) "PUTTING 10 POUNDS OF MUD IN A 5 POUND PAPER SACK" BY FIELD ARTILLERY SCHOOL TRAINING DEVELOPERS. MEANWHILE DEFENSE CONTRACTORS SEE THE TRAINING DEVELOPMENT PROCESS AS NAIVELY VERY SIMPLE OR ELSE A "RIDDLE WRAPPED IN AN ENIGMA" OF CONFLICTING MATERIAL DEVELOPER AND COMBAT DEVELOPER REQUIREMENTS.

(SLIDE 2) THIS BRIEFING WILL ADDRESS THE PROBLEM SHARED BY ALL TRAINING DEVELOPERS WORKING TO PROVIDE A TRAINING TEST SUPPORT PACKAGE FOR TRAINING USER TROOPS. SPECIFICALLY THE BRIEFING OBJECTIVES ARE THESE. FIRST, A REVIEW OF THE VARIOUS DEPARTMENT OF DEFENSE, DEPARTMENT OF THE ARMY, AND

(SLIDE 2A) TRADOC IMPOSED REQUIREMENTS ON NEW SYSTEMS TRAINING DEVELOPERS; SECOND, WHAT ARE THE CONTRIBUTING PROBLEMS INHERENT TO DEVELOPING TRAINING FOR NEW SYSTEMS; AND LASTLY, A LOOK AT THE FIELD ARTILLERY SCHOOL'S ANALYSIS PROCEDURES FOR INTEGRATING CONTRACTOR AND SCHOOL EFFORTS.

(SLIDE 3) LIKE OTHER BRANCHES, SCHOOLS, AND CENTERS, THE FIELD ARTILLERY WILL BE FIELDING MANY NEW ITEMS AND SYSTEMS, OR ADOPTING FOR USE COMMERCIALLY AVAILABLE ITEMS OR FOREIGN MADE ITEMS AND SYSTEMS. IN SUPPORT OF THIS TREMENDOUS TRAINING DEVELOPMENT EFFORT THE FIELD ARTILLERY HAS EITHER CONTRACTED OUT ALREADY OR PLANS TO CONTRACT FOR APPROXIMATELY 3 MILLION DOLLARS OF ANALYSIS EFFORT FOR THESE NEW FIELD ARTILLERY SYSTEMS.

(SLIDE 4) THE MULTINATIONAL MULTIPLE LAUNCH ROCKET SYSTEM (MLRS) ANALYSIS EFFORT COST APPROXIMATELY 600 THOUSAND DOLLARS AND INCLUDES INDIVIDUAL TASK ANALYSIS, SOLDIERS MANUALS, TRAINERS GUIDES, AND SKILL QUALIFICATION TESTS FOR MOS 13M EQUIPMENT PECULIAR TASKS.

METEOROLOGY DATA SYSTEM (MDS) ALSO KNOWN AS FAMAS IS A 30 THOUSAND DOLLAR EFFORT WHICH WILL DELIVER TO THE FIELD ARTILLERY EQUIPMENT PECULIAR INDIVIDUAL AND COLLECTIVE TASK ANALYSIS AND A CROSSWALK BETWEEN THE TWO.

PERSHING II, A STRATEGIC WEAPONS SYSTEM, IS A JOINT ANALYSIS EFFORT BETWEEN THE MISSILE MUNITIONS MAINTENANCE CENTER AND SCHOOL, AND THE FIELD ARTILLERY SCHOOL. THIS ONE MILLION 200 THOUSAND DOLLARS BUYS EQUIPMENT PECULIAR INDIVIDUAL AND COLLECTIVE TASK ANALYSIS AND CROSSWALKS FROM WHICH MARTIN-MARIETTA WILL ALSO DEVELOP PROGRAMS OF INSTRUCTION.

LOCKHEED'S REMOTELY PILOTED VEHICLE ANALYSIS IS A ONE MILLION DOLLAR EFFORT ALSO DELIVERING EQUIPMENT PECULIAR INDIVIDUAL AND COLLECTIVE TASK ANALYSIS AS WELL AS CROSSWALKS.

LASTLY, THE TARGETING CELL, A MILITARY ADAPTION OF A COMMERCIAL ITEM, THE APPLE II COMPUTER, AND PROPOSED DOCTRINAL CHANGES IS AN EFFORT TO BE CONTRACTED WITH BDM CORPORATION. THIS 300 THOUSAND DOLLAR ANALYSIS WILL DELIVER INDIVIDUAL AND COLLECTIVE TASK ANALYSIS AND THE CROSSWALKS WHICH WILL SERVE AS A BASIS FOR POI DEVELOPMENT.

(SLIDE 5) THE FIELD ARTILLERY SCHOOL'S APPROACH TO FRONT END ANALYSIS FOR NEW SYSTEMS HAS BEEN TWO-FOLD. IT IS FIRST A COMBINATION OF MANAGEMENT TECHNIQUES RELATING TO CONTRACTING OUT WORK UNDER THE GUIDANCE OF OMB CIRCULAR A-76, SETTING OF MILESTONE SCHEDULES, AND UTILIZATION OF ALL SOURCE DATA AVAILABLE. SECONDLY, IT IS THE UITLIZATION OF DETAILED METHODICAL ANALYSIS TECHNIQUES ADDRESSING BOTH EQUIPMENT-PECULIAR COLLECTIVE AND INDIVIDUAL TASKS AS WELL AS THE INTEGRATION OF THE TWO IN A CROSSWALK DOCUMENT. THE RESULT OF THIS CONTRACTOR EFFORT IS IN TURN INTEGRATED INTO THE SCHOOL'S JOB/TASK ANALYSIS PROCESS.

(SLIDE 6) THIS DETAILED, METHODICAL ANALYSIS PROCESS IS KEY TO THE SUPPORT OF THE NEW EQUIPMENT. IT IS ALSO ESSENTIAL TO THE METHODICAL TESTING OF THE SYSTEMS AT VARIOUS POINTS IN THE LIFE CYCLE. IDEALLY, A SYSTEM PROGRESSES THROUGH A LENGTHLY LIFE CYCLE AND UNDERGOES SEVERAL TESTS. KEY TESTS TO THE TRAINING DEVELOPER ARE THE OPERATIONAL TESTS, OT I, II, AND IN SOME CASES, OT III, AND THE FORCE DEVELOPMENT TEST AND EVALUATION (FDTE). THESE TESTS REQUIRE THAT THE ENTIRE SYSTEM OF MAN, MACHINE,
(SLIDE 7) HUMAN FACTORS, BE EXAMINED. TO SUPPORT SUCH A DETAILED EVALUATION 5 TEST SUPPORT PACKAGES ARE REQUIRED. THE MATERIAL DEVELOPER IS TASKED TO PROVIDE TWO. THE NEW EQUIPMENT TRAINING TSP IS SUPPOSED TO TRANSFER KNOWLEDGE OF THE EQUIPMENT TO THE TRAINING DEVELOPER SO THAT TRAINING DEVELOPMENT CAN OCCUR. IT HAPPENS TOO LATE AND IS OFTEN INADEQUATE FOR THE FIELD ARTILLERY'S USE. THE SECOND MATERIAL DEVELOPER PACKAGE IS THE MAINTENANCE TSP. THIS PACKAGE CONSISTS OF MATERIAL TMs, PARTS, TOOLS, ETC. WHICH ARE REQUIRED TO MAINTAIN THE EQUIPMENT. THE TRADOC PROPONENT IS TASKED FOR THE REMAINING THREE PACKAGES. THE DOCTRINAL AND ORGANIZATIONAL

TSP DETAIL THE TACTICAL MANNER IN WHICH THE SYSTEM WILL BE USED WHILE THE THREAT SUPPORT PACKAGE DESCRIBES THE THREAT AGAINST THE SYSTEM. THE LAST PACKAGE, THE TRAINING TEST SUPPORT PACKAGE, TTSP, IS WHAT IS MOST IMPORTANT TO THE TRAINING DEVELOPER FROM THE STANDPOINT OF TIME AND MANPOWER RESOURCES REQUIRED.

(SLIDE 8) THE TTSP CONSISTS USUALLY OF THESE ITEMS. ALL THESE ITEMS ARE REQUIRED BY VARIOUS PUBLICATIONS. ALL ARE REQUIRED TO BE BASED ON A VALID JOB/ TASK ANALYSIS. THEIR DEGREE OF DRAFT DEVELOPMENT DEPENDS ON THE QUALITY REFERENCES AVAILABLE AS WELL AS WHERE A SYSTEM IS IN THE LIFE CYCLE.

(SLIDE 9) THE REQUIREMENT FOR A JOB/TASK ANALYSIS IS BASED ON SEVERAL DOCUMENTS. TOP-DOWN, BROAD GUIDANCE FROM THE DEPARTMENT OF DEFENSE IS DOD DIRECTIVE 5000.1, "MAJOR SYSTEM ACQUISITIONS". THIS DIRECTIVE REQUIRES INTEGRATION OF SUPPORT, MANPOWER, AND RELATED CONCERNS (TRAINING) INTO THE ACQUISITION PROCESS. ARMY REGULATION 1000-1, IN TURN, EMPHASIZES THE REQUIREMENT TO FIELD A COMPLETE TRAINING SUPPORT PACKAGE AS AN INTEGRAL PART OF EACH NEW MATERIAL SYSTEM.

TRADOC REGULATIONS AND PAMPHLETS PROVIDE GREATER MORE SPECIFIC GUIDANCE ON WHAT THE TRAINING DEVELOPER IS REQUIRED TO DO. 71-9 SPECIFICALLY REQUIRES A JOB/TASK ANALYSIS IN ACCORDANCE WITH TRADOC PAMS 350-30 AND 351-4. THIS JOB/TASK ANALYSIS REQUIRES GREAT AMOUNTS OF TIME, MANPOWER, EQUIPMENT AVAILABILITY, AND TECHNICAL SOURCE DATA.

(SLIDE 10) THIS JOB/TASK ANALYSIS CAN BE LOOKED AT AS THE INTEGRATION OF ALL TASKS, TACTICAL, COMMON, SHARED, AND ESPECIALLY THE TASKS PECULIAR TO A NEW

SYSTEM. THIS LAST CATEGORY IS ESPECIALLY DIFFICULT TO IDENTIFY AND DEFINE.

(SLIDE 11) THESE ARE SOME OF THE OBSTACLES TO A JOB/TASK ANALYSIS. A COMPRESSED LIFE CYCLE WHICH SHORTENS THE TIME TO FIELD HARDWARE ALSO DECREASES THE TIME AVAILABLE TO DEVELOP TRAINING PRODUCTS. THE AMOUNT OF WORK TO ACCOMPLISH REMAINS THE SAME.

THE PRIMARY SOURCE FOR TRAINING DEVELOPMENT IS THE LOGISTICS SUPPORT ANALYSIS RECORD (LSAR). THE LSA DEFINITIONS FOR TASKS AND THE TRADOC DEFINITIONS ARE DIFFERENT. OFTEN AS LONG REANALYSIS OF LSAR IS REQUIRED TO IDENTIFY TASKS IN ACCORDANCE WITH TRADOC REQUIREMENTS.

THE LSAR SELECTION CRITERIA FOR TRAINING TASKS AND SELECTING SITE LACK THE DETAIL DESCRIBED IN TRADOC DOCUMENTATION AND UTILIZED BY THE FIELD ARTILLERY SCHOOL.

EXTENSION TRAINING MATERIAL (ETM) IS A SOURCE OF CONFUSION FOR THE DEVELOPER. A CONTRACTOR CAN DEFINE TASKS THE WAY HE WANTS AND NOT IN ACCORDANCE WITH TRADOC PAM 350-30 METHODOLOGY. ALSO MANY MATERIAL DEVELOPERS AND CONTRACTORS KNOW ONLY OF SPAS/ETM ANALYSIS. SOME PROJECT MANAGERS AND TSMs SEE THE TTSP AS THE SCHOOL'S PROBLEM - NOT THEIRS.

LASTLY, THERE IS NO FEA STANDARD OR SPECIFICATION A TRAINING DEVELOPER CAN IDENTIFY IN A DATA CALL FOR WRITING INTO A CONTRACT.

(SLIDE 12) THE REQUIREMENT FOR DEVELOPMENT OF ALL PRODUCTS FROM A COMMON ANALYSIS BASE IN SUFFICIENT TIME AND IN PARALLEL WITH HARDWARE DEVELOPMENT RESULTED IN USAFAS DEVELOPING A STATEMENT OF WORK. THIS STATEMENT OF WORK REQUIRES THREE DELIVERABLES. THEY ARE THE TASK INFORMATION CROSS-WALKS, COLLECTIVE TRAINING EVALUATION OUTLINES, AND INDIVIDUAL TASK ANALYSIS.

(SLIDE 13) ADDITIONALLY, THE STATEMENT OF WORK REQUIRES THE CONTRACTOR SHARE IN THE TASK AND SITE SELECTION BOARDS, AS WELL AS BE TRAINED IN TRADOC PAMPHLET 350-30 PROCEDURES.

(SLIDE 14) THE STATEMENT OF WORK ALSO SPECIFICALLY REQUIRES IDENTIFICATION OF OPERATOR AND MAINTENANCE TASKS.

INCREMENTAL DELIVERY OF TASKS ARE CALLED OUT AND THERE ARE BOTH INFORMAL AND FORMAL REVIEWS. THE CONTRACTOR AND THE FIELD ARTILLERY SCHOOL ARE TIED TO A SCHEDULE FOR THE JOINT WORK EFFORT.

THE LSAR CONTINUES TO BE THE BASIC SOURCE FOR TASKS AND AN AUDIT TRAIL TO THE LSAR IS REQUIRED.

(SLIDE 15) CROSSWALK SHEETS WILL BE THE FIRST DELIVERABLE DESCRIBED. THIS CROSSWALK SHEET INTEGRATES COLLECTIVE AND INDIVIDUAL TASKS. TO ACCOMPLISH THIS EFFORT THE CONTRACTOR IS PROVIDED TASKS ALREADY IDENTIFIED BY THE FIELD ARTILLERY. THE CONTRACTOR IS REQUIRED TO IDENTIFY HIS SYSTEM'S RELATED TASKS.

(SLIDE 16) ADDITIONALLY, THE CONTRACTOR LOOKS AT THE RELATIONSHIP OF SKILL LEVELS AND DUTY POSITIONS TO TASKS. PERFORMANCE AND/OR SUPERVISION OF THE TASK IS TENTATIVELY DETERMINED.

(SLIDE 17) EXAMPLES OF SOME POSSIBLE TASK CATEGORIES A CONTRACTOR MAY EXAMINE ARE C^3, OPERATING THE SYSTEM, AND OTHER TRADITIONAL CATEGORIES.

(SLIDE 18) THIS CROSSWALK PROCESS IS KEY TO AN ANALYSIS HIERARCHY. CONTRACTORS BUILD SYSTEMS TO PERFORM SPECIFIED MISSIONS. DEFINITE ORGANIZATIONS ARE DESIGNED OR DESIGNATED TO OPERATE THE SYSTEM AND PERFORM THE MISSION. SPECIFIC MOS ARE IDENTIFIED OR CREATED IN SUPPORT OF THE MISSION AND ORGANIZATION. COLLECTIVE AND INDIVIDUAL TASKS, ELEMENTS, AND SKILLS/KNOWLEDGES FALL OUT AS THE ANALYSIS PROGRESSES.

(SLIDE 19) THE SECOND DELIVERABLE OF INDIVIDUAL TASK ANALYSES ARE KEY TO THE DEVELOPMENT OF SOLDIERS MANUALS, SQT, TRAINERS GUIDES, POI, AND LESSON PLANS.

(SLIDE 20) THE CONTRACTOR IS REQUIRED TO ACCOMPLISH SOME BASIC STEPS PRIOR TO PRESENTING HIS TASKS TO THE FIELD ARTILLERY SCHOOL. THEY ARE REQUIRED TO IDENTIFY SYSTEM-RELATED INDIVIDUAL TASKS. CONDITIONS AND STANDARDS FOR EACH TASK MUST BE WRITTEN AND ELEMENTS OF TASKS IDENTIFIED. THE
(SLIDE 21) REFERENCES FOR THE TASKS MUST ALSO BE LISTED. THIS EFFORT IS IDENTIFIED AS A TASK ANALYSIS INFORMATION SHEET (TAIS) PACKAGE.

(SLIDE 22) THESE TAIS PACKAGES ARE FORWARDED FOR USAFAS REVIEW AND COMMENT.

(SLIDE 23) WHEN THESE PACKAGES MEET USAFAS STANDARDS, APPROVAL IS GIVEN.

(SLIDE 24) USAFAS ANALYSTS THEN PREPARE QUESTIONNAIRES FOR EACH TAIS PACKAGE.

(SLIDE 25) THESE QUESTIONNAIRES ARE FORWARDED TO USAFAS AND CONTRACTOR PERSONNEL WHO ARE KNOWLEDGABLE OF THE SYSTEM. THESE PERSONNEL ANSWER THE QUESTIONNAIRES.

(SLIDE 26) THE CONTRACTOR'S ANALYSTS WHO RESPOND TO THE QUESTIONNAIRES ALSO PARTICIPATE IN THE BOARD PROCESS AND MEET THESE OTHER REQUIREMENTS.

(SLIDE 27) AT THESE BOARDS THE START POINT FOR TASK SELECTION IS THE OUTPUT OF THE USAFAS MODEL. THE BOARD REVIEWS THE RECOMMENDED DEGREE OF TRAINING AND SITE. BOTH USAFAS AND THE CONTRACTOR CAME TO AN AGREEMENT ON A CRITICAL TASK LIST AND TRAINING SITE.

(SLIDE 28) AFTER AN INITIAL BOARD ANY OF SEVERAL ACTIONS MAY OCCUR. A RECONVENING OF THE BOARD MAY BE REQUIRED FOR SOME TASKS. LEARNING ANALYSIS FOR TASKS IS COMPLETED. THERE MAY BE REDEVELOPMENT OF REJECTED TASKS OR SOME REDESIGN.

(SLIDE 29) THE LAST DELIVERABLE OF COLLECTIVE TASK OUTLINES ARE KEY INPUT TO WRITING ARTEPs.

(SLIDE 30) THESE COLLECTIVE OUTLINES ARE RELATED TO COLLECTIVE TASKS IDENTIFIED ON THE CROSSWALKS. THEY ARE MISSION RELATED AND CONSIST OF TASK, CONDITIONS,

AD-A114 273 ARMY TRAINING DEVELOPMENTS INST FORT MONROE VA F/G 5/9
PROCEEDINGS OF THE TRADOC/TRAINING DEVELOPMENTS INSTITUTE (6TH)--ETC(U)
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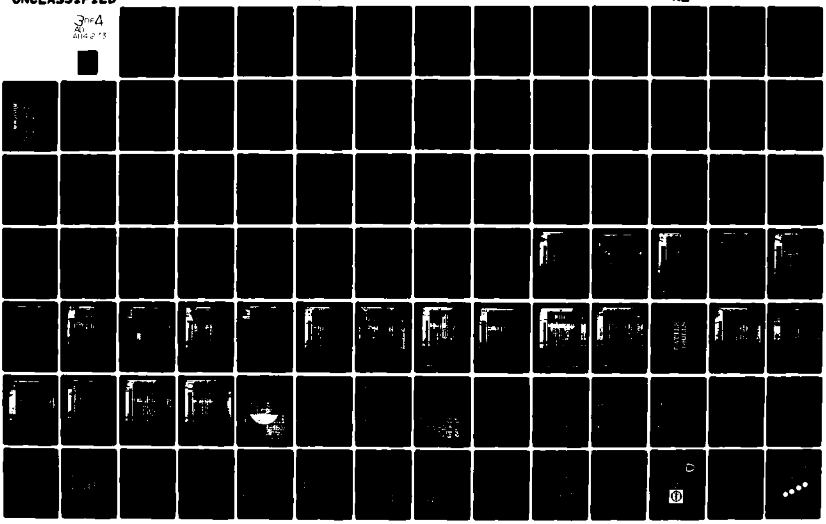

STANDARDS. THESE TASKS ARE ALSO TIED TO LSAR OR OTHER REFERENCES.

(SLIDE 31) OTHER BACKGROUND REFERENCES THAT MAY BE AVAILABLE TO THE CONTRACTOR ANALYST ARE FUNCTIONAL FLOW BLOCK DIAGRAMS WHICH RELATE MAN, MACHINE, SOFTWARE, AND COMMUNICATIONS, TIME LINE ANALYSIS, AND SYSTEM OPERATION TACTICS AND TECHNIQUES OR ORGANIZATIONAL AND OPERATIONAL CONCEPTS.

(SLIDE 32) THE SCHOOL AND CONTRACTOR HAVE TEAMED TOGETHER FOR THESE SYSTEMS TO PRODUCE EQUIPMENT-PECULIAR INDIVIDUAL TASKS. IN MOST CASES DETAILED CROSSWALKS AND COLLECTIVE TASKS ARE ALSO DELIVERED. IN A FEW CASES POI, LESSON PLANS, SOLDIERS MANUALS, TRAINERS GUIDES AND SQT INPUT HAVE ALSO BEEN DELIVERED.

(SLIDE 33) THE FIELD ARTILLERY SCHOOL PLANS TO CONTINUE ITS CLOSE ANALYSIS EFFORT WITH CONTRACTORS. THIS EFFORT WILL BE INITIATED EARLY PREFERABLY AT PRE-MILESTONE 0 WHEN STUDIES ARE BEING CONDUCTED.

COLLECTIVE TASK DEFINITION HAS BEEN A CONTINUING PROBLEM. WHAT IS A WORKABLE DEFINITION FOR COLLECTIVE TASK? A DEFINITION WHICH IS CLEAR TO THE CONTRACTOR AND IS AGREED TO BY ALL TRAINING DEVELOPERS IS NEEDED.

THE NEW EQUIPMENT TRAINING TSP AND TTSP SHOULD BE DEVELOPED FROM THE SAME COMMON ANALYSIS BASE. THEY ARE NOT NOW AND RESOURCES ARE WASTED SETTING THINGS RIGHT. REQUIRED OPERATIONAL CAPABILITY DOCUMENTS AND LETTERS OF AGREEMENT FOR FIELD ARTILLERY SYSTEMS NOW INCLUDE SPECIFIC REQUIREMENTS FOR UTILIZATION OF A COMMON ANALYSIS BASE. ETM IS ALSO REQUIRED TO BE DEVELOPED FROM THIS SAME COMMON ANALYSIS BASE.

FRONT END

ANALYSIS

FOR

NEW

FIELD ARTILLERY

SYSTEMS

THE PROBLEM

TO PROVIDE A TRAINING TEST SUPPORT PACKAGE FOR TRAINING USER TROOPS AND PLANNING DATA COLLECTION IN THE AREA OF TRAINING REQUIREMENTS.

BRIEFING OBJECTIVES

- OUTLINE DOD/DA/TRADOC IMPOSED REQUIREMENTS FOR TRAINING NEW SYSTEMS
- PROBLEMS ASSOCIATED WITH NEW SYSTEMS ANALYSIS
- USAFAS NEW SYSTEMS ANALYSIS PROCEDURES

ANALYSIS COSTS

MLRS	$600 K (APPROX)
MDS	30 K
P II	1.2 M
RPV	1 M
TARGETING CELL	300 K

USAFAS

NEW SYSTEMS ANALYSIS

PROCEDURES

* MANAGEMENT
* FRONT END ANALYSIS

LIFE CYCLE TESTS

OTI/	OTII/FOE/	CEP/
FDTE-OFT	FDTE-IOC	OTHER FDTE

TEST SUPPORT PACKAGES

- NEW EQUIPMENT TRAINING TSP
- MAINTENANCE TSP
- DOCTRINAL & ORGANIZATIONAL TSP
- THREAT SUPPORT PACKAGE
- TRAINING TSP

TRAINING TEST SUPPORT
PACKAGE

- TRAINING CONCEPT
- SOLDIERS MANUALS
- TRAINERS GUIDES
- ARTEP CHANGES
- PROGRAM OF INSTRUCTION
- DRAFT SQT MATERIAL
- TRAINING AIDS
- TRAINING DEVICES
- LESSON PLANS
- ETM PLANS

JOB/TASK ANALYSIS

- DODD 5000.1
- AR 1000.1
- TRADOC Reg 71-9
- TRADOC Reg 351-4
- TRADOC Pam 350-30
- TRADOC Pam 351-4

INTEGRATION
OF
ALL TASKS

- TACTICAL
- COMMON
- SHARED
- EQUIPMENT - PECULIAR

CONTRIBUTING PROBLEMS

- COMPRESSED LIFE CYCLE
- LSA TASK DEFINITIONS
- TASK SELECTION CRITERIA
- SITE SELECTION CRITERIA
- SPAS/ETM CONFUSION
- LACK OF FEA SPECIFICATION

NEW SYSTEMS

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USAFAS
STATEMENT OF WORK

- TASK INFORMATION "CROSSWALK SHEETS"
- TASK ANALYSIS INFORMATION SHEETS
- COLLECTIVE TRAINING EVALUATION OUTLINE

USAFAS

STATEMENT OF WORK

- CONTRACTOR PARTICIPATION IN PERIODIC TASK/SITE SELECTION BOARDS

- CONTRACTOR TRAINING ANALYSTS ARE ISD-TRAINED

USAFAS
STATEMENT OF WORK

- OPERATOR TASKS
- MAINTENANCE TASKS
- INCREMENTAL DELIVERY
- IN PROCESS REVIEWS
  (FORMAL INFORMAL)
- DEFINITE SCHEDULE
- LSAR RELATED

USAFAS

STATEMENT OF WORK

- TASK INFORMATION "CROSSWALK SHEETS"
- COLLECTIVE TRAINING EVALUATION OUTLINE
- TASK ANALYSIS INFORMATION SHEETS

TASK INFORMATION
"CROSSWALK SHEET"

- EACH COLLECTIVE TASK

- SUBCOLLECTIVE TASKS

- INDIVIDUAL TASKS
  - TASKS ALREADY IDENTIFIED IN 13 CMF
  - SYSTEM RELATED

TASK INFORMATION
"CROSSWALK SHEET"

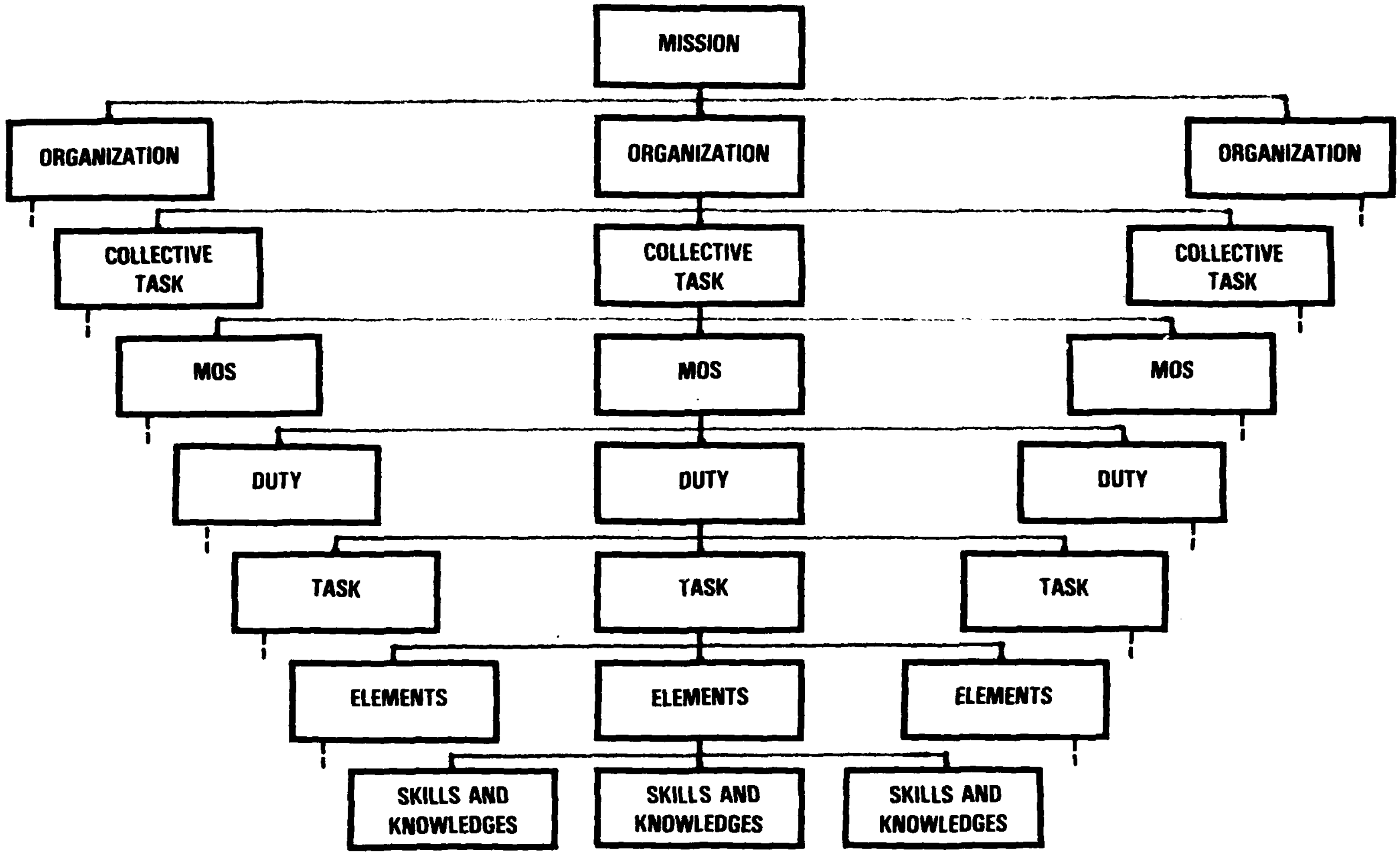
- SKILL LEVEL/DUTY POSITION
- DUTY POSITION RELATIONSHIP TO TASK
  - PERFORM
  - PERFORM/SUPERVISE
  - SUPERVISE
  - NONE OF THE ABOVE

INDIVIDUAL/COLLECTIVE TASKS

RELATED TO

- COMMAND
- CONTROL
- COMMUNICATIONS
- OPERATIONS
- EMPLACEMENT
- DISPLACEMENT
- MOVEMENT

ANALYSIS HIERARCHY



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USAFAS

STATEMENT OF WORK

- TASK INFORMATION
  "CROSSWALK SHEETS"
- TASK ANALYSIS
  INFORMATION SHEETS
- COLLECTIVE TRAINING
  EVALUATION OUTLINE

ANALYSIS PROCEDURES TO BE ACCOMPLISHED

ACTIONS PRIOR TO TASK SITE SELECTION BOARD

- IDENTIFY SYSTEM-RELATED INDIVIDUAL TASKS

- CRITERION OBJECTIVE (CONDITIONS & STANDARDS)

- ELEMENTS

- REFERENCES (PDEPS, LSRR, TMS, FMS, SOTT)

ANALYSIS
WORKFLOW

CONTRACTOR PREPARED

TAIS PACKAGES

ANALYSIS WORK FLOW

TAIS PACKAGES

↓

USAFAS REVIEW

ANALYSIS WORK FLOW

TAIS PACKAGES

↓

USAFAS REVIEW

↓

USAFAS APPROVAL

ANALYSIS WORK FLOW

TAIS PACKAGES

↓

USAFAS REVIEW

↓

USAFAS APPROVAL

↓

QUESTIONNAIRES PREPARED

ANALYSIS WORK FLOW

TAIS PACKAGES

↓

USAFAS REVIEW

↓

USAFAS APPROVAL

↓

QUESTIONNAIRES PREPARED

↓

USAFAS AND CONTRACTOR
SMES ANSWER

BOARD REQUIREMENTS

- PARTICIPATE IN ALL SELECTION BOARDS
- TWO CONTRACTOR TRAINING ANALYSTS
- ALWAYS SAME ANALYSTS
- ISD-TRAINED

BOARD PRODUCTS

START POINT BASIS
USAFAS MODEL

↓

BOARD RESULTS

↓

USAFAS & CONTRACTOR
AGREEMENT

↓

CRITICAL TASK LIST & SITE

ACTIONS AFTER BOARD

(AGREEMENT REACHED BETWEEN
CONTRACTOR AND USAFAS)

- RECONVENE BOARD, IF NECESSARY
- DESIGN INDIVIDUAL TASKS
  (CRITICAL TASK LIST)
  - CRITERION TEST
  - SKILL/KNOWLEDGES
  - ENABLING OBJECTIVES
  - ENABLING TEST
- REDEVELOP REJECTED TASKS
- REDEVELOP/REDESIGN

USAFAS

STATEMENT OF WORK

- TASK INFORMATION
  "CROSSWALK SHEETS"

- TASK ANALYSIS
  INFORMATION SHEETS

- COLLECTIVE TRAINING
  EVALUATION OUTLINE

COLLECTIVE TRAINING/EVALUATION OUTLINE

BACKGROUND REFERENCES

- FUNCTIONAL FLOW BLOCK DIAGRAMS
- TIME LINE ANALYSIS
- SOTT

COLLECTIVE

TRAINING/EVALUATION CUTLINE

- RELATED TO "CROSSWALK"
- MISSION RELATED
- TASK STATEMENT
- CONDITIONS
- STANDARDS
- REFERENCES (TMS, FMS, LSAR)

SCHOOL/CONTRACTOR INTERFACE

	TAIS	CW	CT	POI	LP	SM	TG	SQT
MLRS	X	S	S	S	S	X	X	X
MDS	X	X	X	S	S	S	S	S
P II	X	X	X	X	X	S	S	S
RPV	X	X	X	S	S	S	S	S
TARGETING CELL	X	X	X	X	S	S	S	S

SUMMARY

AND

FUTURE DIRECTIONS

- PRE-MILESTONE 0 EFFORT
- COLLECTIVE TASK DEFINITION
- NEW EQUIPMENT TRAINING
  TSP/TTSP INTERFACE
- COMMON ANALYSIS BASE
  SOURCE FOR ETM

SOFT SKILLS ANALYSIS

The Analysis of Non-Procedural Tasks

1. For over the last 4 years, techniques to analyze things not analyzable using the ISD Task Analysis Procedures has been sought by the Training Developments Community. Industry and academia have conducted research in the past several years to also find techniques to analyze these softer type behaviors. When ISD was first developed, it was to deal with that major portion of formal Army training activities, which is the Initial Entry Training of soldiers. The majority of the performances required for entering soldiers into the Army are pri marily procedural tasks. Procedural tasks consist of such things as simple assemble and dissemble of a M-16 rifle, to multiple procedural tasks such as certain forms of troubleshooting. The intent of ISD was to develop a straight forward procedural method for analyzing procedural tasks. Chapter 8 of the Job Task Analysis Handbook (TRADOC Pamphlet 351-4) further explains a very detailed technique and procedure for analyzing these procedural tasks. It basically consist of breaking the steps down into smaller and smaller pieces of behavior and when put back together in training, always results in successful accomplish of the task. This is a perferred method of analyzing any behavior but only if lends itself to being proceduralized. The reason being that you always get successful performance when you properly apply the procedure. In this era of standardization and due to the need in the Army for an order to be followed by performance which results in the same outcome each time proceduralizing of all behavior is a goal. However, certain tasks even for initial entry soldiers require other methodology. Such behavior over-lap into the area of procedural and

Skill Level 3 and above requires other methodology for analyzing non-procedural type behavior. Such behavior of the low end over-lap into the area of procedural and consist of such things as some forms of trouble-shooting, tactics, straight forward tactics, some forms of performance supervision and so on which will call transfer tasks and go on up to the complex end in other areas of leadership ethnics, detailed forms of supervision, management, motivation, in that area we traditionally call it soft skills. Classically, behavior that is been called soft skills needs to be analyzed differently simply because the performance and the methods of performance are very different depending on situations and depending on the individual performing them. Classically, there is then situational variance, individual variance and with these two variables we find that the softer the activity the less certain we are that we are going to achieve the same outcome each time. Because of the amount of variance involved a procedural approach to these behaviors would either require a infinite amount time to identify all possible procedures and branches of those procedures or would in fact be impossible to make sure you ever capture all of the different ways the bahavior could be accomplished. Therefore, the appproach to be taken is to identify principles, rules, problem solving techniques, generalizable skills, competencies, all of which together provide a background of knowledge by which a performer can select the best course of action based on the situation, based on his experience and based on the outcome he must achieve. The major element of difference between procedural tasks, transfer tasks and what we shall call complex behaviors is the amount of processing done by the individual in making the decision on the best course of action. For instance, the techniques employed by a

supervisor in assessing the work being conducted by his subordinants and the corrective actions he takes are certainly observable. However, the actual behavior which is being performed is only partically captured by direct observation with the individual. The amount of cognitive processing that is ongoing in performance of these duties, is in fact a major portion of the behavior. All of the information gathered by the supervisor in the performance of these behaviors he uses to arriveat a decision to then make corrective action and to provide guidance. The techniques he employes internally to array the information and select the best course of action and then the method in which he selects to execute those things are all in fact the internal possesses that must be identified, analyzed, examined and documented if training and training developments activities are going to accurately occur subsequently. The similarity between analysis of these complex behaviors with procedural tasks is that we are still attempting to find what job performance and behavior is necessary to accomplish the mission of the individual. Like in a procedural task analysis it is essential that individuals complete behavior, be identified as systematically as possible, so that training and training decisions can be made as to the best way to communicate what these behaviors are to individuals who we expected to exhibit them in the future. This is exactly the same purpose of any analysis activity. As in any other application of a methodology, very, very few of the behaviors subject to this discussion are going to be purely complex behaviors or transfer tasks or procedural tasks, but are going to be elements of all three. Because of the probability of outcome not always

being 100% for these complex behaviors and transfer tasks, it is essential that as often as possible behavior be proceduralized to maximize the outcome. Because each analysis situation and the experience of the analyst conducting these procedures are going to be different in almost every situation analysis of transfer tasks of themselves are going to be coplex behaviors. The application of these behaviors require them to be very different. Therefore, the output of the analysis of these behaviors is also going to be classically a probability in which a certain amount of error exist. Therefore, the application of these behaviors must be constantly verified, reviewed and revised to insure the validity of the results of these analyses. These behaviors don't lend themselves easily to being documented. A technique for communicating the actual critical essence of these complex behaviors requires the best and simplest techniques of written communication be used such that the follow-on training developments can adequately attend to the important critical issues of these complex behaviors. In addition, the results of these analyses are must be compatable with the existing formats of documenting procedural tasks and some format must be used that allows comparison of the results of these behaviors to other procedural task documentation found in Soldiers Manuals and MOS manuals. Although the rather standard task, condition standard and, job performance measure format might be able to be used, the content of this documentation will be significantly different. Techniques for evaluating proper accomplishment of these behaviors is also not an easy job. However, the alternative to carefully and comprehensively documenting these behaviors and figuring out techniques for

evaluating them is absolutly essential if a reliable standard method of training is to be developed for Skill Level 3 and above soldiers in our modern Army. It has often been said that these behaviors cannot be analyzed. However, the consequences of not being able to analyze and document these complex behaviors is an admission that these skills also probably cannot be properly trained. If that's the case, then an enormous amount of energy is being spent on a day to day basis of training personnel and behaviors that are not trainable. The situation is not believed to be that. These skills by in large can be trained and therefore, if they can be trained they also must be analyzed to insure a standard quality method of training them be developed. It will require more than a procedural approach to task analysis with a better understanding and more comprehensive training of the personnel applying these complex skills to analyze the new behaviors. The criticality of these behaviors and the training of our junior leaders mandates that not all training analyst should be trained in these complex behaviors. As mentioned in the beginning of this paper, the majority of what our soldiers do are procedures. Therefore, not all analyst must be skilled in analyzing what appears to be something less than 40% of the behaviors required of the field. However, due to the criticality of some of these behaviors, i.e., criticality of good sound supervision, leadership and management required by the Skills Level 3 soldiers and above and

because of the criticality of the other complex behaviors involved in troubleshooting and making proper decisions of even the lower skill level soldiers there should be at least a small percentage of the analyst within each organization and school who are capable of analyzing these very complex behaviors. To further complicate the process there is a very strong feeling by a large number of people in the training developments community and across the Army who do not believe nor desire to apply techniques of analyzing these complex behaviors. Traditionally, it is believed that leadership and supervisory capabilities are things that by in large are not trainable. Fortunately or unfortunately, because of the complexity of modern warfare and because of the non-military orientation of this country over the last 15 to 20 years personnel entering the military who become squad leaders, platoon leaders, Company Commanders, don't arrive ready to apply the skills of military leadership, they must be taught. They must be taught in a training methodology to achievable objectives with conditions and standards appropriate to the field environment. We can no longer afford to hope that the experience of going through a very general educational program of Officer-Training or NCO training will result in qualified leader springing forth ready to lead complex technological advance soldiers and equipment to successfully accomplish combat missions. In the area of Officers (as well as NCO) it has been the long held belief that a good officer or a good NCO can do almost anything with little or no training. There is no doubt that certain people are inheritantly better at solving problems and that their common sense approach to any situation is just better at assessing problems and developing solutions. However, because techniques today don't reliably exist to indicate who these people are, nor because of the voluntary approach to the Army today

are we in a position to turn away people who may or may not possess this inherent problem solving ability. If in fact the skills necessary to aply military leadership are trainable, which it is believed they are, then it is necessary that we systematically identify what these skills are and comprehensively and systematically apply the current state of the art technology in dealing with these complex behaviors to insure we adquately train the people who are available to be our NCO and Officers. We can no longer believe or afford, that in order to properly supervise and lead a soldier one must go through learning how to do the things that a subordiates are doing because of the complex duties of an officer and because many of the Career Management Fields require joining at the higher levels. Our training must be oriented for those skills, those complex behaviors that are necessary to properly manage, direct, supervise and lead. These skills which are some what generic in their application and performance, once trained could then be applied to several different situations, activities and assignments.

The generalizability of these skills and because of the need to identify them realistically based on job performance, mean that a soft skill analysis is more dependent on a comprehensive job analysis or unit analysis than is a more traditional task analysis activity. The job analysis must in addition to using good field survey data must also include a very comprehensive look at the actual performances as well as the cognitive manipulation, other processing or whatever, that is ongoing in individuals who are successfully accomplishing their jobs in the field. There are several techniques which have been used in the recent past to assist in accomplishing this. The techniques basically used a comparison of successful performers to less successful or unsuccessful performers to identify

the differences between them(McBer, Competency Assessment). Further, these methodologies require a complete look at the job because of the impact different situations have on the applications of these more complex behaviors as stated precisely. Differences in the situation coupled with differences in the performers experience are going to change or modify the application of these behaviors in almost every situation. Therefore, as much as possible the existing situations must be carefully documented and examined. Currently, Job Analysis indicates a list of tasks which are further analyzed in a traditional task analysis mode. These tasks are generally analyzed in a very discrete manner with clear cut beginning and ending. Because of the impact of situational various on performance of these complex behaviors a considerable amount of time must be spent in properly identifying the entire range of events which initiate actions and the consequences and potential impact of the completion of the application. One of the imbedded skills in the application of these generic tasks is the need to evaluate the effect of the behavior to determine if it needs to be continued, modified or completely changed. Because the situation is dynamic and could change during the application it is very possible that only through the application of evaluation and adjustment could the outcome of the behavior be successful. This mandates in addition to a simple statement of acomprehensive job analysis that extensive interview and observation of current successful incumbency be accomplished during the job analysis phase. In fact, their is probably no clear cut distinction in dealing with the softer aspects of these behaviors between the completion of a dimensioning of the job or competency based analysis of the behaviors themselves, as it might be in a traditional JTA. As stated above, this is

not something that is going to have to be done for all the tasks or all of the behaviors done during the given job. Because of its increase need for more thorough training as well as more in depth examination, these procedures should only be applied in those areas where they are applicable. However, traditionally the detail of job analyses done over the last 4 or 5 years on the ISD approach has not been satisfactory. The essential and criticalness of this phase to a soft skill analysis cannot be over stated. As one might imagine assessing the successful performance and application of these skills is going to be different, but by in large assessment of these is going to have to be done in a more performance oriented way using techniques that have been developed like for accessment centers. The accessment center concept places an individual in a simulated situation in which he is actually asked to perform and apply the behaviors which are under question. The accessment center technology, although relatively new, does have some fairly extensive research over the last 18 months to 2 years that is providing a relatively reliable data base as to the apropriateness and reliability in which accessment center technology can be aplied. Currently accessment center technology is being utilized in the area of pre-commissioning, it is being placed in position at the Command General Staff College and also at the Army War College. The key to the succesful accessment center technology, as stated above, which is key to the entire soft skill analysis process is the absolute mandated need for a comprehensive job analysis. Such that the entire domain of behaviors affecting the performance on the job are identified so that they can be analyzed and also so that the full impact can be assessed later on. As stated above, the goal of a soft skill analysis or a complex beha-

vior analysis is the same as any other type of front end analysis, i.e., fully identifying the bahaviors required to successfully accomplish a job by an individual. The technologies involved are best represented by several documented techniques. The three techniques which will be recommended to the TRADOC schools are the following: The Extended Task Analysis Procedures; the McBer Competency Model and the Dimension Analysis Model. These three techniques all deal with the two different types of soft skills previously discussed, i.e., transfer tasks and complex behaviors. The first is developed under Army contract and have been staffed to the schools over the past 12 months. It is currently being utilized also by a Government Contractor in the accomplishment of a Basic Skills Education Program Contract. The application of this methodology and its utility to the field is everyday being proven as the model is being applied to the identification of the prerequisite of training in approximately 100 MOS at all the service schools. Training materials, for application of the Extended Task Analysis Procedures have also been developed under Government contract and also been staffed in the field. Improvements, modifications and adjustments have been made based on the comments from th field and real experience in the accomplishment of the BSEP contract.

The second model, Competency Base Model, has been used with the Navy and with selected TRADOC schools in dealing with Officer Basic Course Training and assessing the competencies necessary for the accomplishment of the jobs exaimed. The technique developed by McBer and Associates, compares individuals identified as superior performers by supervisors, peers; subordinates as well as average or marginal performer the same manner, identifies the differences in the application of competencies to accomplish complex tasks and analyzes these through carefully interview and observation technique.

Dimension Analysis is much similar and it also identifies competencies based on a comparison of individuals existing in the job. Dimension Analysis is developed by the leader in the field of assessment center technology and provides the detail job analysis mentioned above, necessary to properly develop an accessment center. The Dimension Analysis technique is the one used by the Army under contract to develop the pre-commissioning assessment centers on line today. Attached to this Chapter, is the User's Manual to describe the model of the extended task analysis procedures. Also available, are articles which describe the Competency Based Approach by McBer and the Dimension Analysis Approach developed by Dynamic Development Inc. As the Competency Based Approach and the Dimension Analysis Approach are both copy righted articles; detailed procedures on the application of these cannot be provided within this document. However, because of the comprehensiveness of the technology involved in either of these, separate arrangements should be made by the schools to directly contact and contract with the authors of these methodologies to insure proper instruction and application is to accomplish. In support of these activities an Extended Task Analysis Workshop is being developed as well as discussions in a seminar format on the application of soft skill procedures will be continued to be conducted by the Occupational Research and Analysis Division of TDI during the Chiefs of Analysis Seminar.

Briefly, all the techniques discussed above in the paper, require a comprehensive problem solving procedure be conducted much similar to the techniques used in any other form of Army staff work or leadership situation. A mission is assigned, the first phase is to identify exactly what the

requirements are to successfully accomplish that mission. More specifically the procedures consist of detail examination of the behaviors on the job through interview and observation as well as literature search and research of existing doctrine, threat and reference materials. By sorting through the behaviors involved and discussions with the Subject Matter Experts a total description of the job to include asorting of procedural task behavior, transfer task behavior and complex behaviors is accomplished and the assignment is made to the people skilled in the area of complex behavior analysis to conduct these in the detail necessary to develop reliable and valid information. Traditional Job and Task Analysis Procedures for Procedural Tasks, an application of the soon to be validated Extended Task Analysis Procedure on Transfer Tasks, can be done by other personnel who have not received the specilized training. By marrying together the results of these three approaches the output should be a total detailed description of what a successful incumbent does, thinks and asks in accomplishing his mission and his job in a field environment. The systematic approach to this process ensures reliability across differing people, accomplishing the procedures and provides a reliable output on which the follow-on products and training developments activities can take place to provide a training package which is reliable and standarized. In our resource constrained environment and its era of criticality and emphasis supervision and leadership required in the technology in the future Army, any other approach then the systematic approach to identifying what is truly critical to be trained to our new leaders and supervisors carries with it an amazing amount of risk. We no longer have the luxury to allow opinions

of what should be trained to be the basis of our leadership training at each and every different location who conducts such training. By marrying up the two basic themes of the system approach of training, i.e., something is not fixed unless its broken; and only instruction should be that directly contributes to enhancements of performance on the job. Coupled with the sincere desire by career Army personnel to assist our supervisiors and leaders in dealing with the softer aspects of their job. This process promises to get us to a place where we can objectively and efficiently accomplish something that has been illusive to the TRADOC community for many years.

CRITICISMS OF 310-8

- TOO DIFFICULT TO READ
- PROCEDURES ARE CONFUSING
- DIAGRAMS ARE CONFUSING
- NEEDS EMPHASIS ON TOP DOWN ANALYSIS
- [illegible] PRACTICAL EXAMPLES
- [illegible] [illegible]FORMATION ON INDIVIDUAL/ [illegible]CTIVE INTERFACE
- [illegible] [illegible]FORMATION FOR DRILL [illegible]
- [illegible] [illegible]FORMATION ON USE OF REVIEW [illegible]RDS

TRADOC PAM 310-8

PROVIDES INFORMATION FOR:

- DEVELOPMENT OF ARTEP
- DEVELOPMENT OF DRILLS
- INDIVIDUAL JOB/TASK ANALYSIS

COMPLETED DRAFT
TRADOC PAMPHLET 310-8

CHAPTER 1	INTRODUCTION
CHAPTER 2	USING THE PAMPHLET
CHAPTER 3	COLLECTIVE FRONT-END ANALYSIS MODEL
CHAPTER 4	METHOD FOR THE DEVELOPMENT OF DRILLS
CHAPTER 5	SPECIAL CASES INVOLVING NEW SYSTEMS
APPENDIX A	SAMPLE SOP
APPENDIX B	CFEA MANAGEMENT PLAN
APPENDIX C	TASK CRITICALITY CRITERIA
APPENDIX D	SAMPLE CREW DRILL
APPENDIX E	SAMPLE TASK ANALYSIS WORKSHEET
APPENDIX F	GLOSSARY
APPENDIX G	SAMPLE AUDIT TRAIL

COLLECTIVE FRONT-END ANALYSIS MODEL

- DEVELOP MANAGEMENT PLAN AND COLLECT DATA
- IDENTIFY AND ANALYZE MISSIONS
- IDENTIFY COLLECTIVE TASKS
- SELECT CRITICAL MISSIONS AND TASKS
- CONDUCT TASK ANALYSIS

STEP 1
MANAGEMENT PLAN

AN ADDED STEP WE THINK IS NECESSARY. THE MANAGEMENT PLAN IDENTIFIES WHAT WILL BE ACCOMPLISHED, THE MILESTONES, RESOURCES REQUIRED, CRITICALITY CRITERIA, AND THE AUDIT TRAIL.

STEP 2
IDENTIFY AND ANALYZE MISSION

THIS STEP EMPHASIZES THE TOP-DOWN ANALYSIS PROCESS.

[illegible] WITH [illegible], THE TOE, DOCTRINE, ETC. AND

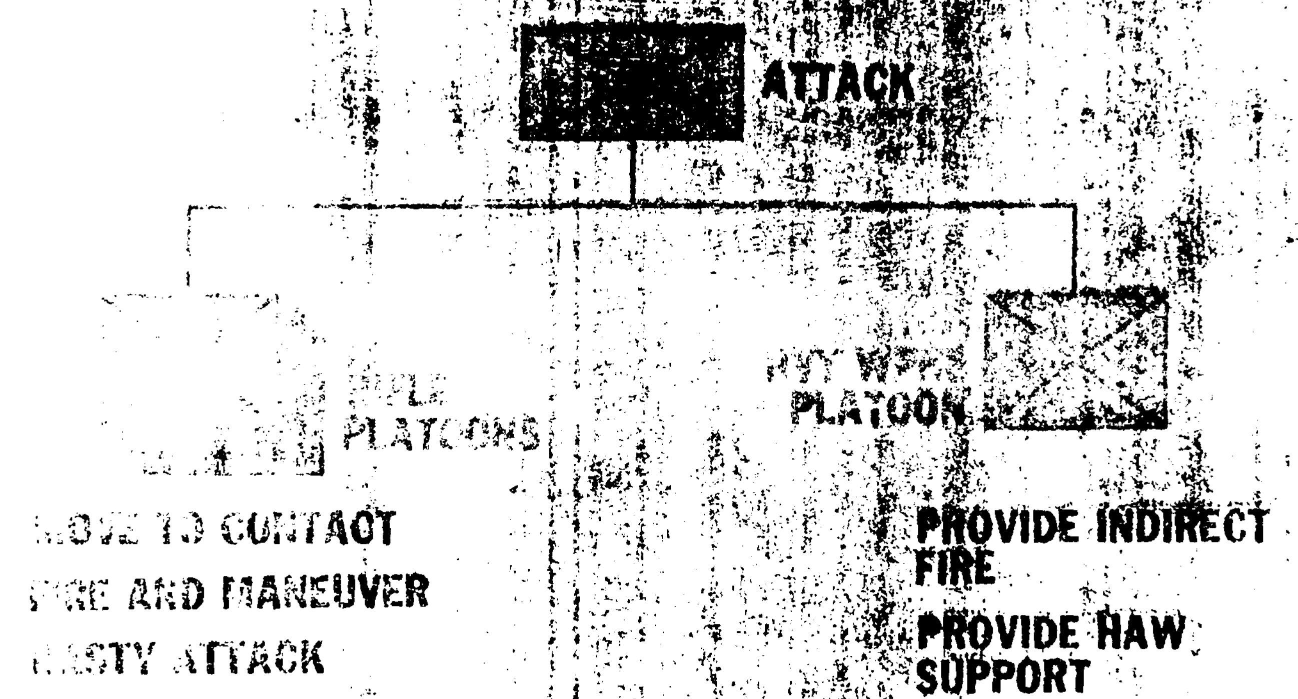
[illegible] THE MISSIONS, BOTH STATED AND IMPLIED,

[illegible] IDENTIFIED.

STEP 2 - RESULTS
LISTING OF UNIT MISSIONS

STATED	IMPLIED
ATTACK	NEGOTIATE OBSTACLES BREACH A MINEFIELD
DEFEND	DEFENSIVE POSITIONS FRONT AND DEPTH ALTERNATE/ SUPPLEMENTARY POSITIONS

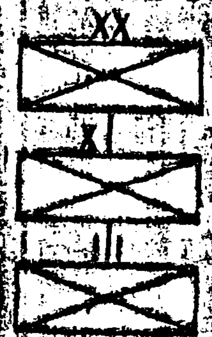
STEP 2 - MISSION FUNCTION DIAGRAM



STEP 2 - RESULTS

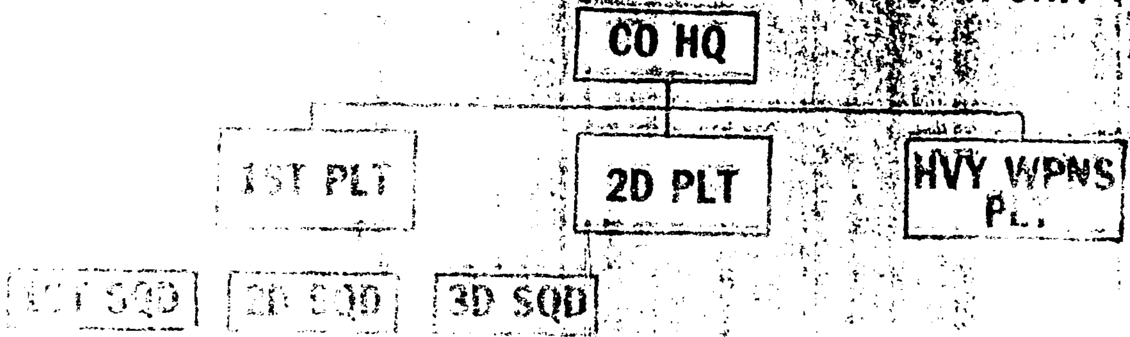
COMMAND STRUCTURE DIAGRAM

WHERE THE UNIT FITS IN THE COMMAND STRUCTURE



UNIT STRUCTURE DIAGRAM

DEPICTS SUBORDINATE ELEMENTS OF A UNIT



STEP 3
IDENTIFY COLLECTIVE TASKS/SUBTASKS

THE PURPOSE OF THIS STEP IS TO PROVIDE A TOTAL LISTING [illegible] WHICH ARE DEVELOPED, AND THEN VERIFIED BY [illegible] DEPENDING UPON THE DENSITY OF THE UNIT. [illegible] THE FIRST TIME, THOSE TASKS WHICH LEND THEMSELVES TO DRILLS ARE IDENTIFIED.

STEP 3 - RESULTS

- MISSION: ATTACK

  COLLECTIVE TASK: MOVE TO CONTACT (PLATOONS)

  SUB-COLLECTIVE TASK: FIRE AND MANEUVER (SQUAD)

  INDIVIDUAL SM TASK: MOVE AS A MEMBER OF FIRE TEAM

- MISSION: DEFEND

  COLLECTIVE TASK: CONSOLIDATE AND REORGANIZE (PLATOONS)

  SUB-COLLECTIVE TASKS: OCCUPY PRIMARY POSITIONS
  PREPARE SUPPLEMENTARY POSITIONS
  (SQUADS)

  INDIV[illegible] SM [illegible]: ESTABLISH COVER AND CONCEALMENT

  [illegible]SKS: ASSIGNS SECTOR OF FIRE
  SELECTS DRAGON AND MG POSITIONS

STEP 4
SELECT CRITICAL MISSIONS/TASKS

HERE, THROUGH THE USE OF CRITICAL CRITERIA, THE CRITICAL MISSIONS/TASKS ARE DETERMINED. FIRST, THE ANALYSTS, THROUGH THE USE OF CRITICALITY CRITERIA, COMES UP WITH CRITICAL MISSIONS/TASKS, AND NON-CRITICAL MISSIONS/TASKS. THE REVIEW BOARD GETS THESE LISTS AND MAKES THE FINAL DETERMINATION OF THE MISSIONS AND TASKS.

STEP 4 - RESULTS

APPROVED CRITICAL MISSIONS/TASKS

- ATTACK
- DEFEND
- WITHDRAW
- PURSUIT

- MOVE TO CONTACT
- CONSOLIDATE/REORGANIZE
- OPERATE IN AN NBC ENVIRONMENT
- MAINTAIN CONTACT WITH ENEMY

NON-CRITICAL MISSION/TASKS

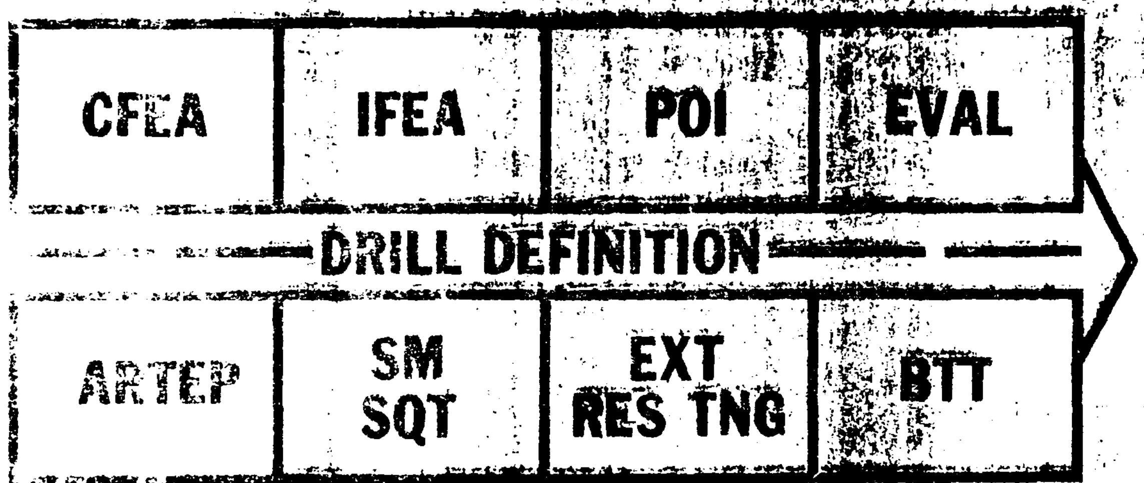
JUSTIFIED AND RECORDED FOR SELECTION BOARD

STEP 5
CONDUCT TASK ANALYSIS

THIS STEP IS TO BREAK DOWN EACH COLLECTIVE TASK INTO SUB-COMPONENTS - PROCEDURES, RESULTS, AND STEPS, PLUS THE MEASURABLE CRITERIA FOR SUCCESS AND ANY CONDITIONS THAT EFFECT THE PERFORMANCE. THE PROCEDURE TO ACCOMPLISH THIS IS A CAREFULLY CONDUCTED SERIES OF INTERVIEWS. THE OUTPUT OF THIS STEP WILL BE SUBORDINATE COLLECTIVE TASKS THAT REQUIRE FURTHER ANALYSIS, COMPONENTS OF THE TASKS BEING ANALYZED AND INDIVIDUAL AND LEADER TASKS. THESE LEADER/INDIVIDUAL TASKS SHOULD BE PROVIDED TO THE INDIVIDUAL ANALYSTS FOR FURTHER ANALYSIS AND INTEGRATION INTO THEIR CRITICAL TASKS LIST. THIS IS THE SECOND POINT IN THE ANALYSIS AT WHICH THE COLLECTIVE AND INDIVIDUAL ANALYSTS HAVE INTERFACED/COORDINATED. THE OUTPUTS OF THIS STEP ARE A SERIES OF COLLECTIVE TASK ANALYSIS WORKSHEETS AND A REPORT OF THE METHOD USED TO CONDUCT THE ANALYSIS.

STEP 5 - RESULTS

TASK	CONDITION	STANDARDS	SUB-COLLECTIVE TASK	SM TASK	LEADER TASK
PLATOON CONDUCTS TACTICAL MOVEMENT	CONTACT EXPECTED	PLATOON MOVES ALONG CORRECT ROUTE WITHOUT EXPOSING MORE THAN THE LEAD ELEMENT TO OPFOR OBSERVATIONS	SQUAD MOVES IN BOUNDING OVERWATCH	MOVE AS A MEMBER OF A FIRETEAM	REPORTS PHASE LINES OR CHECK POINTS



SCHOOL HOUSE "STABLE" MODEL
USES EXISTING RESOURCES

BATTLE DRILLS

DRILL METHODOLOGY

DEFINE

SELECT ARTEP TASK

DECOMPOSE TASK
- LEADER TASK
- COLLECTIVE TASK
- SOLDIERS MANUAL TASK

ARRANGE TRAINING HIERARCHY

IDENTIFY CURRENT TRAINING FOR EACH TASK

DEVELOP PROCEDURES FOR TRAINING EACH DECOMPOSED STEP (DRILL)

- REVIEW/ADJUST ALL TASK
- DECIDE CRITICAL/NON-CRITICAL TASK
- DETERMINE BEGINNING/END
- ESTABLISH SCENARIO
- DEVELOP PERFORMANCE MODEL
- DEVELOP INTEGRATED MODEL
- ESTABLISH OBSERVANCE MEASUREMENTS (STANDARDS
- DEVELOP INDIVIDUAL/COLLECTIVE EVALUATION METHODS

MATCH WITH DRILL DEFINITION

MATCH WITH OTHER ARTEP TASKS

DETERMINE SM/SQT INTERFACE

BATTLE DRILL DEFINITION:

COLLECTIVE TASKS DENOTING CLOSE WITH AND KILL THE ENEMY AND MOVEMENT IS A MAJOR FACTOR; DERIVED FROM ARTEP, SM AND 'HOW TO FIGHT' MANUALS.

ARTEP MISSION: MOVEMENT TO CONTACT
TASKS: CONDUCT TACTICAL MOVEMENT
BATTLE DRILL: SQUAD MOVES IN BOUNDING OVERWATCH

TASK DECOMPOSITION	LEADER TASK	COLLECTIVE TASK	SM TASK
CONTROL FIRE TEAM	X		
SQUAD LEADER CHANGES FROM TEAM TO TEAM	X		
MOVE AS A MEMBER OF A FIRE TEAM			X
COVER & CONCEALMENT			X
BOUNDING ELEMENT WITHIN [illegible] METERS OF OVERWATCHING ELEMENT		X	
SELECT TEMPORARY BATTLEFIELD POSITIONS	X		
OVERWATCH ELEMENT COVERS BOUNDING ELEMENT		X	

...OGICAL TRAINING HIERARCHY

1. SQUAD LEADER RECON ROUTE
2. SQD LDR INFORMS TM LEADERS OF OVERWATCH POSITIONS AND ROUTES OF ADVANCE
3. SQD LEADER COORDINATES SIGNALS FOR RATE OF MOVEMENT, TIMING OF BOUNDS
4. SQD LDR ATTACHES WEAPONS TO OVERWATCH ELEMENT
5. SQD LDR CONTROLS MOVEMENT
6. FIRE TEAMS DO NOT HALT OR MOVE AT THE SAME TIME FOR MORE THAN ONE MINUTE
7. INDIVIDUALS MOVE AS MEMBER OF FIRE TEAM
8. INDIVIDUALS TAKE ADVANTAGE OF AVAILABLE COVER AND CONCEALMENT
9. BOUNDING ELEMENT WITHIN 150 METERS OF OVERWATCHING ELEMENT
10. OVERWATCH ELEMENT COVER BOUNDING ELEMENT BY OBSERVATION AND FIRE
11. INDIVIDUALS MAINTAIN VISUAL CONTACT WITH LEADERS
12. SELECT TEMPORARY BATTLEFIELD POSITIONS

DEVELOP TRAINING GUIDELINES

- TASK/CONDITION/STANDARDS
- NATURAL START AND ENDING POINTS
- USE FRIENDLY, ENEMY TERRAIN CONDITIONS
- PERFORMED IN MINUTES
- MAXIMIZE APPLICATION ACROSS ARTEP MISSION
- KEYED TO DEVELOPMENT OF SM/SQT

DEVELOP HOW TO TRAIN/ EVALUATE SCENARIO

SQUAD LEADER TRAINS SOLDIERS TO MASTER SM TASK

PLATOON LEADER TRAINS SQUAD LEADER AND SQUAD IN COLLECTIVE AND SM LEADER TASKS

CO-COMMANDER TRAINS PLATOON LEADER AND PLATOON IN COLLECTIVE AND PLATOON LEADER TASK

U.S. ARMY SOLDIER SUPPORT CENTER

NATIONAL CAPITOL REGIO

ARMY OCCUPATIONAL SURVEY PROGRAM (AOSP)

COMPREHENSIVE OCCUPATIONAL DATA ANALYSIS PROGRAMS (CODAP)

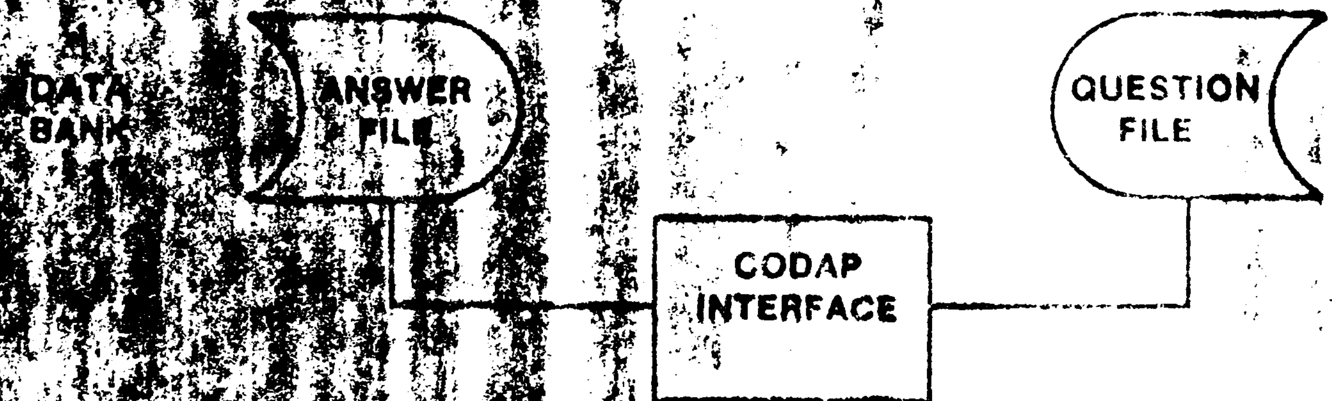
7VA 2405-7/14

USES FOR OCCUPATIONAL DATA

- JOB ANALYSES
- TASK ANALYSES
- INSTRUCTIONAL SYSTEMS
- PROFICIENCY MEASURES
- CAREER DEVELOPMENT
- OCCUPATION STRUCTURES
- JOB SATISFACTION
- PERSONNEL UTILIZATION

AOSP

- OCCUPATIONAL SURVEYS OF ENLISTED, WARRANT, AND OFFICER SPECIALTIES
- MERGES CODAP WITH THE MILITARY OCCUPATIONAL DATA BANK



AOSP YEARLY OBJECTIVES

- 60 - 70 ENLISTED INCUMBENT SURVEYS TO INCLUDE TRAINING EMPHASIS/LEARNING DIFFICULTY
- 30 - 35 OFFICER (COMMISSIONED AND WARRANT) SURVEYS TO INCLUDE APPROPRIATE TRAINING FACTORS

SURVEY LIFE CYCLE

	APPROXIMATE TIME REQUIRED
QUESTIONNAIRE DEVELOPMENT	12 WEEKS
CAMERA-READY COPY PREPARATION	4 WEEKS
QUESTIONNAIRE PRINTING	5 WEEKS
QUESTIONNAIRE DISTRIBUTION AND ADMINISTRATION	20 WEEKS
DATA REDUCTION	4 WEEKS
REPORT GENERATION	2 WEEKS
	TOTAL - 48 WEEKS

ARMY OCCUPATIONAL SURVEY PROGRAM

PROGRAM ELEMENTS

- **QUESTIONNAIRE DEVELOPMENT**
- **DATA COLLECTION**
- **DATA REDUCTION**
- **OUTPUT REPORTS**
- **DATA ANALYSIS**

ARMY OCCUPATIONAL SURVEY PROGRAM

SURVEY CONTENT

OFFICER/WARRANT OFFICER	*ENLISTED*
BACKGROUND INFORMATION	BACKGROUND INFORMATION
ACTIVITIES	TASKS
POSITION RESPONSIBILITIES & REQUIREMENTS	EQUIPMENT
ADDITIONAL SKILL & DUTIES	SPECIAL REQUIREMENTS
EQUIPMENT	JOB SATISFACTION
PERSONAL COMMENTS	PERSONAL COMMENTS

C O D A P

RELATIVE TIME SPENT SCALE

- VERY MUCH BELOW AVERAGE
- BELOW AVERAGE
- SLIGHTLY BELOW AVERAGE
- AVERAGE TIME SPENT
- SLIGHTLY ABOVE AVERAGE
- ABOVE AVERAGE
- VERY MUCH ABOVE AVERAGE

USED FOR ALL ENLISTED SURVEYS, BEING TESTED WARRANT/COMMISSIONED OFFICER SURVEYS

PART OF POSITION SCALE

1 = INSIGNIFICANT PART OF POSITION

2 = SLIGHTLY SIGNIFICANT PART OF POSITION

3 = SOMEWHAT SIGNIFICANT PART OF POSITION

4 = MODERATELY SIGNIFICANT PART OF POSITION

5 = QUITE SIGNIFICANT PART OF POSITION

6 = HIGHLY SIGNIFICANT PART OF POSITION

7 = EXTREMELY SIGNIFICANT PART OF POSITION

TRAINING EMPHASIS SCALE

VERY LOW EMPHASIS

LOW EMPHASIS

BELOW AVERAGE EMPHASIS

AVERAGE EMPHASIS

ABOVE AVERAGE EMPHASIS

HIGH EMPHASIS

VERY HIGH EMPHASIS

COMPREHENSIVE
OCCUPATIONAL
DATA
ANALYSIS
PROGRAMS

7UIA 7405-1/14 CHS

CODAP

METHOD:

- LARGE SCALE SURVEYS OF JOB INCUMBENTS AND THEIR SUPERVISORS
- COMPUTER PROCESSING OF SURVEY DATA
- ANALYSIS BY TRAINED SPECIALISTS OF THE PROCESSED RESULTS

7VA 2408-3/14 LR

C O D A P

HISTORY:

- RESEARCH BY US AIR FORCE 1958 -1967
- RESEARCH CONTINUES AT US AIR FORCE HUMAN RESOURCES LABORATORY
- OPERATIONAL

AF	1967
MC	1971
NAVY	1971
ARMY	1973

FROM SUPERVISORS/SME's

CODAP CAN PROVIDE:

- TRAINING EMPHASIS
- LEARNING DIFFICULTY
- CONSEQUENCES OF INADEQUATE PERFORMANCE
- TASK DELAY TOLERANCE
- OTHER FACTORS RELATED TO TRAINING DECISIONS

FROM JOB INCUMBENTS

CODAP PROVIDES:

- PROBABILITY OF TASK PERFORMANCE (PERCENT PERFORMING)
- AVERAGE PERCENT TIME SPENT BY DUTY AND TASK
- A PROFILE (e. g., AVERAGE PAYGRADE, DISTRIBUTION BY COMMAND AND LOCATION, EDUCATIONAL LEVEL)
- EQUIPMENT USED, MAINTAINED, ETC
- IMPORTANCE OF SKILLS, KNOWLEDGE, ABILITIES, RESPONSIBILITIES, AND PHYSICAL CHARACTERISTICS
- MEASURES OF JOB SATISFACTION, UNIT MORALE, AND CAREER INTENT

CODAP

TYPICAL OUTPUT:

TASK	% DO	RANK	TRAINING EMPHASIS	RANK	LEARNING DIFF	RANK
REPAIR WIDGETS	80	1	6.0	1	5.0	2
REBUILD WIDGETS	20	2	4.5	2	6.5	1
PREPARE SEER	10	3	2.5	3	4.0	3

AOSP

MAJOR PROBLEMS:

- TIMELINESS (LEAD/REACTION TIME)
- FLEXIBILITY (TYPE DATA COLLECTED)
- CHANGES TO SCHOOL TASK LIST

AOSP

INITIATIVES:

- PURSUING IN-HOUSE WPC AND COMPUTER
- MODIFIED POLICY TO ALLOW MORE TRAINING ORIENTED DATA COLLECTION
- ACQUIRED NEW AF TRAINING ORIENTED CODAP PROGRAMS (FACPRT)
- PURSUING REGISTERED/1st-CLASS MAILING
- DEVELOPING AOSP/CODAP GUIDE

AOSP

INITIATIVES (CONT.):

- INCREASED TDY
- REVISING AR 611-3
- INTERNAL CONTROLS TIGHTENED
- REVISED METHODS OF OPERATION BEING INVESTIGATED

C O D A P

TASK FACTOR PRINT PROGRAM (FACPRT)

- **PRINTS SUCH INFORMATION (VECTORS) AS PERCENT PERFORMING TASKS BY MONTHS OF SERVICE AND TASK FACTOR RATINGS**
- **CAN CREATE "MODULES" OF TASKS BASED ON <u>USER INPUT</u> (E.G., IN POI SEQUENCE OR CRITICAL/NON-CRITICAL)**
- **CAN SORT TASKS WITHIN THESE "MODULES" BASED ON ANY VECTOR INCLUDED IN THE OUTPUT**

US ARMY DARCOM

MATERIEL READINESS SUPPORT ACTIVITY

(MRSA)

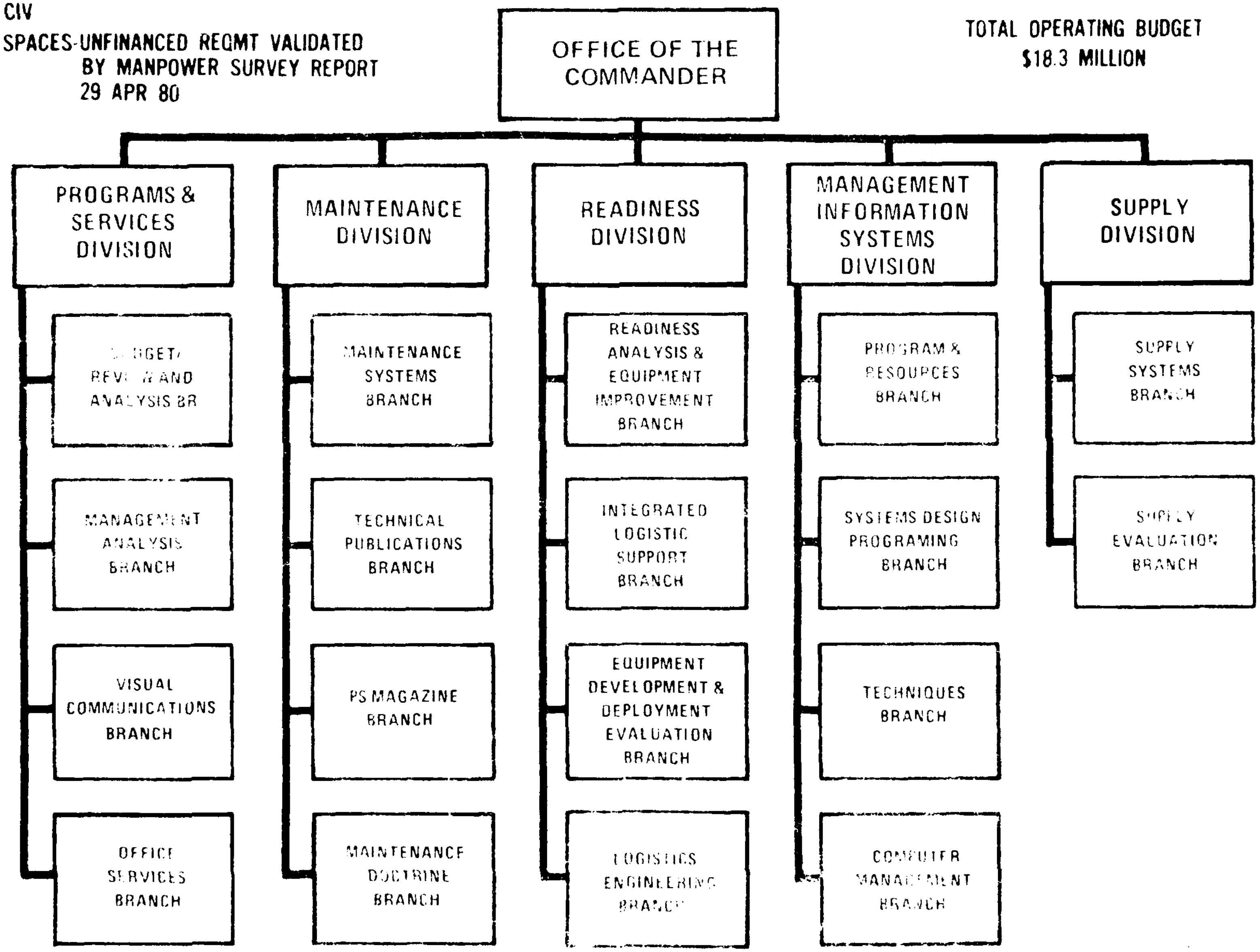
LEXINGTON, KENTUCKY

US ARMY MATERIEL DEVELOPMENT AND READINESS COMMAND

US ARMY DARCOM MATERIEL READINESS SUPPORT ACTIVITY

11 MIL
348 CIV
86 SPACES-UNFINANCED REQMT VALIDATED BY MANPOWER SURVEY REPORT 29 APR 80

TOTAL OPERATING BUDGET
$18.3 MILLION



LOGISTIC
SUPPORT
ANALYSIS
RECORD

AD-A114 273 ARMY TRAINING DEVELOPMENTS INST FORT MONROE VA F/G 5/9
PROCEEDINGS OF THE TRADOC/TRAINING DEVELOPMENTS INSTITUTE (6TH)--ETC(U)
FEB 82

UNCLASSIFIED NL

4 OF 4
AD
A114 273

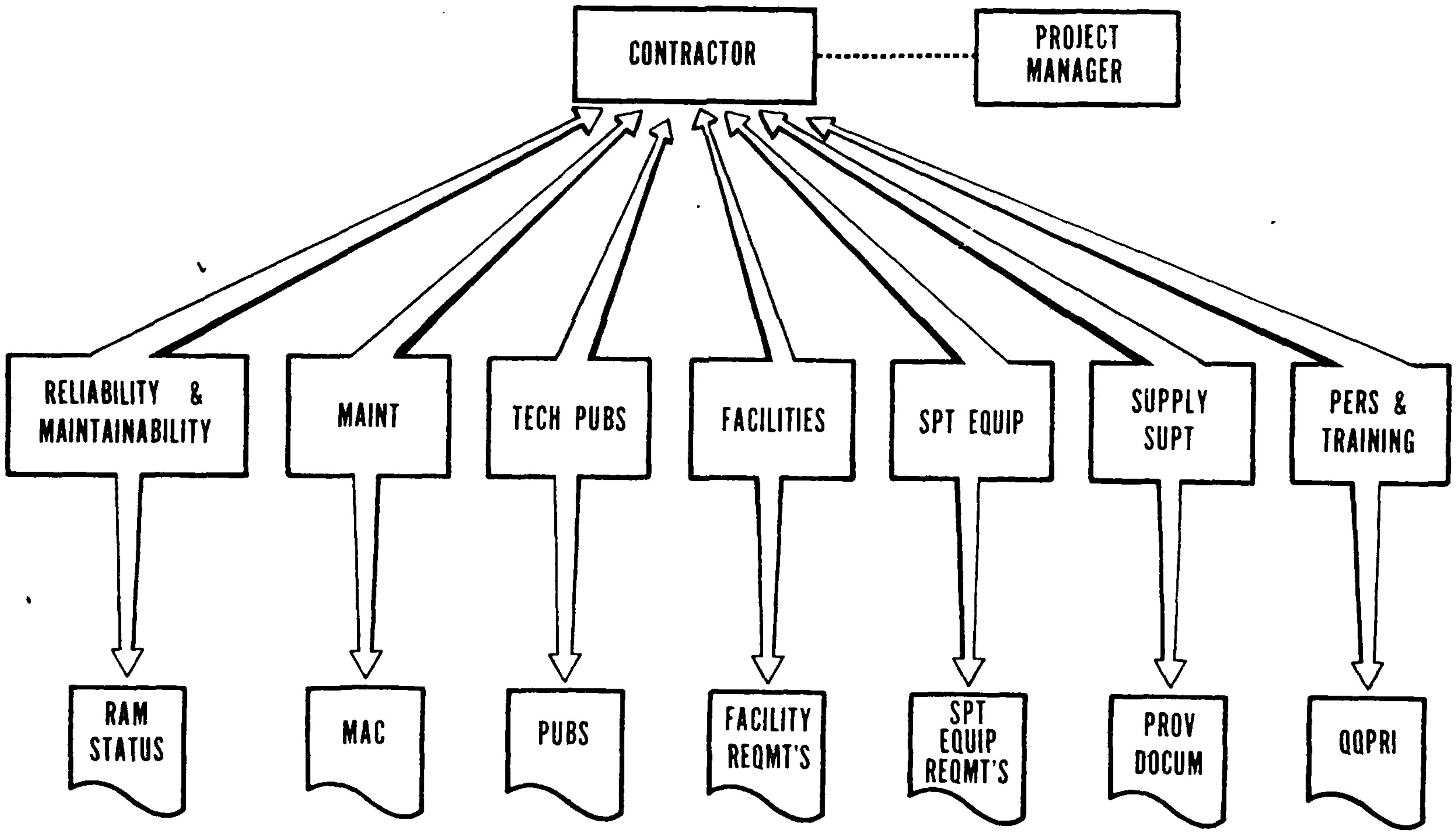
END
DATE
FILMED
6-82
DTIC

ILS - A UNIFIED AND ITERATIVE APPROACH TO THE MANAGEMENT AND TECHNICAL ACTIVITIES NECESSARY TO: (A) CAUSE SUPPORT CONSIDERATIONS TO INFLUENCE REQUIREMENTS AND DESIGN; (B) DEFINE SUPPORT REQUIREMENTS THAT ARE OPTIMALLY RELATED TO THE DESIGN AND TO EACH OTHER; (C) ACQUIRE THE REQUIRED SUPPORT; AND (D) PROVIDE THE REQUIRED SUPPORT DURING THE OPERATIONAL PHASE AT MINIMUM COST.

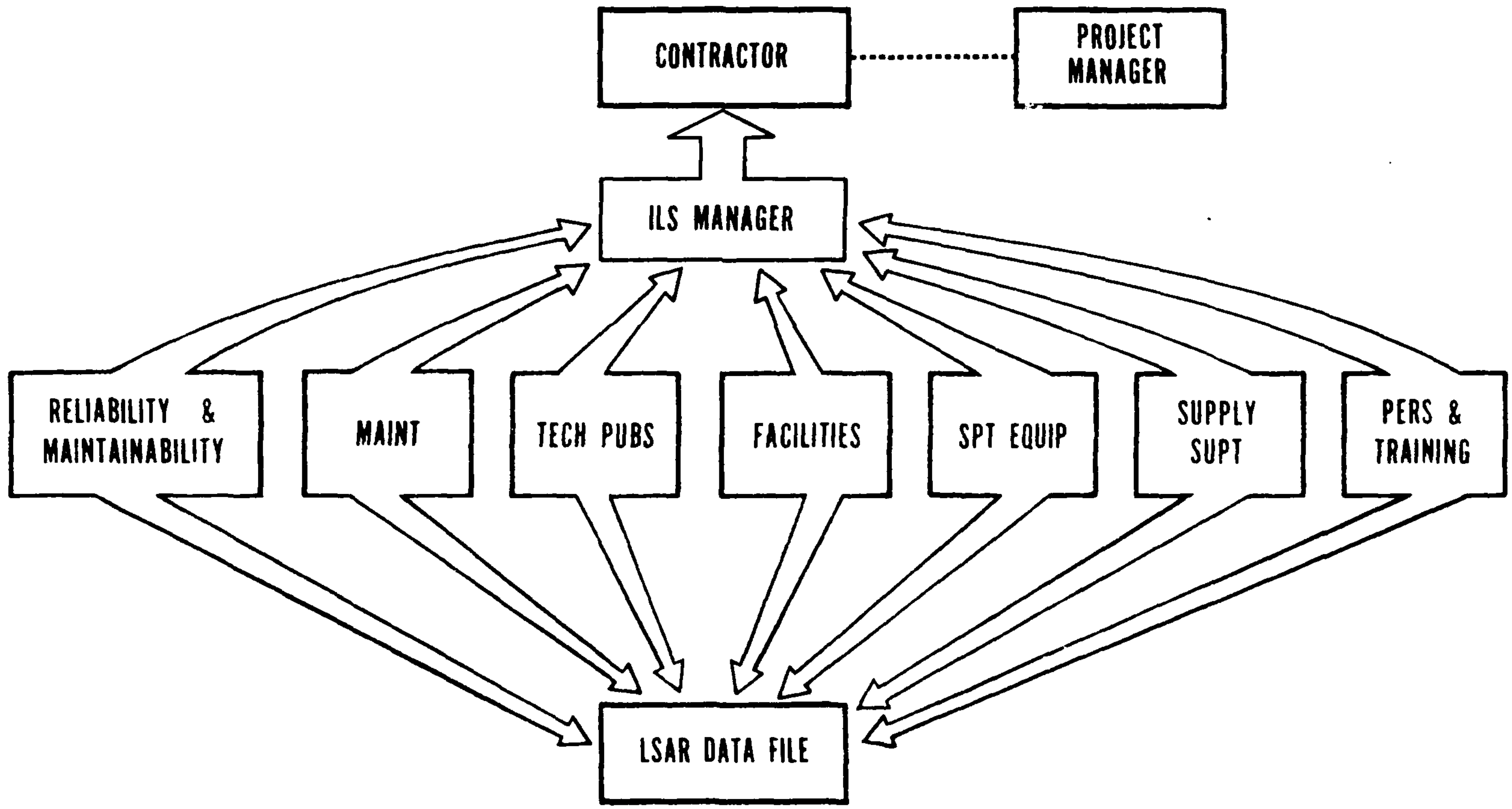
LSA - THE SINGLE LOGISTIC ANALYTICAL EFFORT USED TO DEFINE SUPPORT CRITERIA AND SUPPORT SYSTEM REQUIREMENTS.

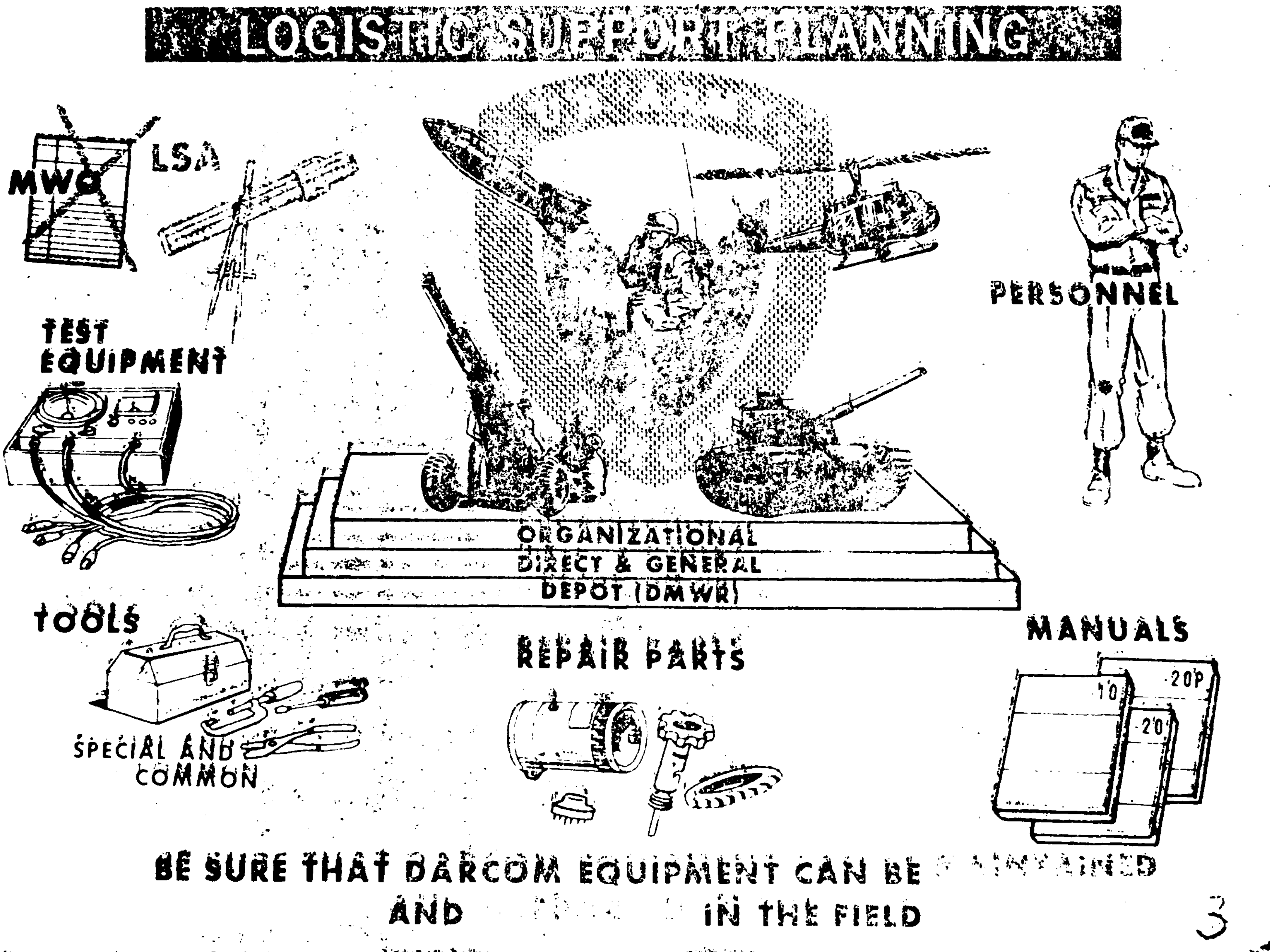
LSAR - A FILE WHICH PERMITS ORDERLY AND COST-EFFECTIVE INPUT, STORAGE, ANALYSIS, AND RETRIEVAL OF LSA AND LSA-RELATED INFORMATION.

ILS MANAGEMENT - CONTRACTOR



ILS MANAGEMENT - CONTRACTOR




LOGISTIC SUPPORT PLANNING
MWO
LSA
TEST EQUIPMENT
PERSONNEL
ORGANIZATIONAL
DIRECT & GENERAL
DEPOT (DMWR)
TOOLS
SPECIAL AND COMMON
REPAIR PARTS
MANUALS
10
20
20P
BE SURE THAT DARCOM EQUIPMENT CAN BE
AND
IN THE FIELD

3

LSAR INPUT DATA SHEETS

A - END ITEM MAINTENANCE REQUIREMENTS

B - HOW THE ITEM FAILS

C - WHERE AND WHO FIXES THE FAILED ITEM

D - HOW THE FAILED ITEM IS FIXED

E - DESCRIPTION AND JUSTIFICATION FOR SPECIAL TOOLS, TMDE, AND TRAINING EQUIPMENT

F - DESCRIPTION AND JUSTIFICATION FOR NEW FACILITIES

G - REQUIREMENTS AND JUSTIFICATION FOR NEW SKILLS

H - REPAIR PARTS REQUIREMENTS-PROVISIONING

J - TRANSPORTABILITY ENGINEERING CHARACTERISTICS

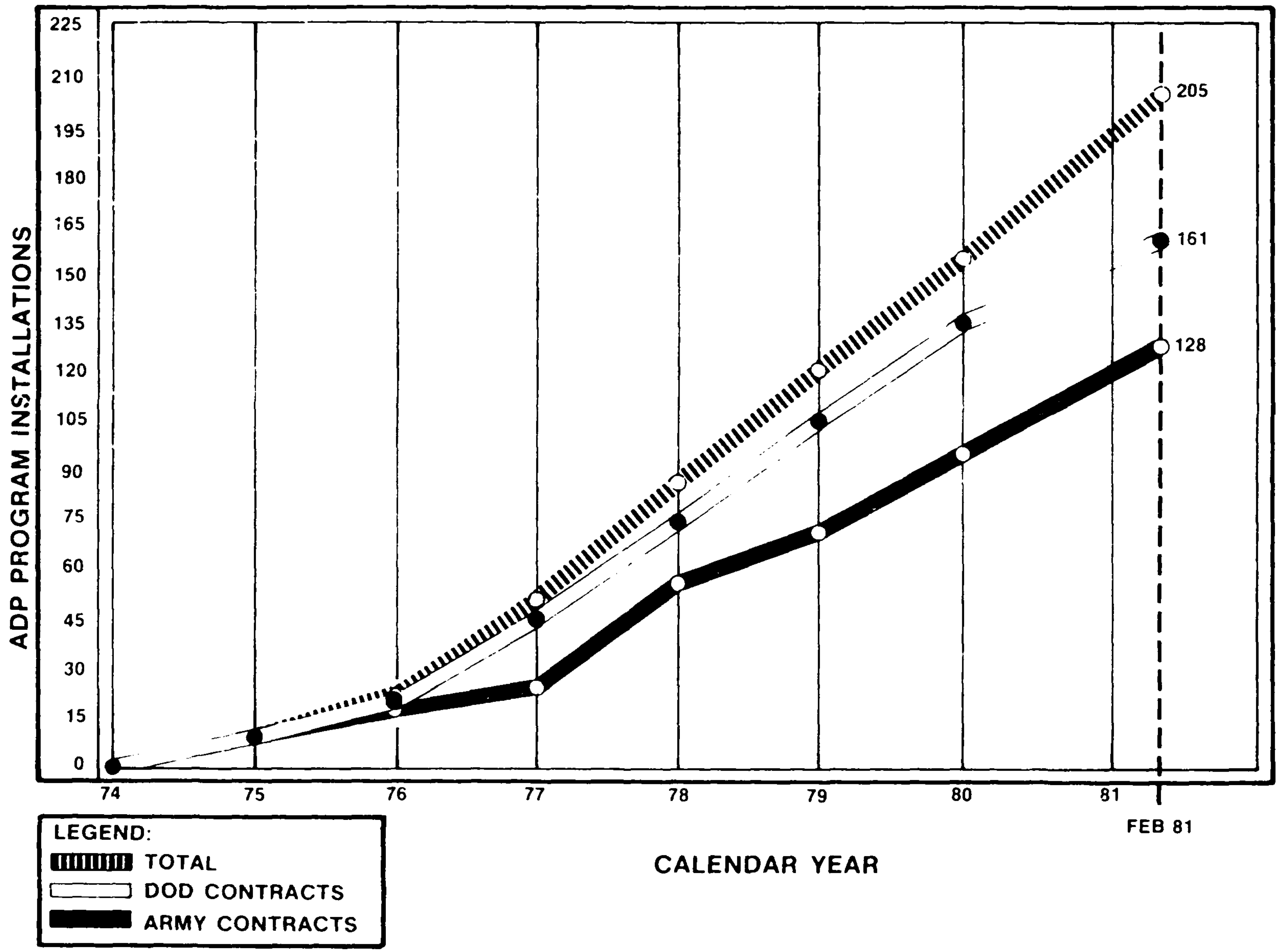
LSAR OUTPUT SUMMARIES

01 DIRECT ANNUAL MAINTENANCE MAN-HOURS
02 PERSONNEL AND SKILL SUMMARY
03 RELIABILITY AND MAINTENANCE SUMMARY
04 MAINTENANCE ALLOCATION SUMMARY
05 SUPPORT ITEM UTILIZATION SUMMARY
06 CRITICAL MAINTENANCE TASK SUMMARY
07 SUPPORT ITEM REQUIREMENTS BY SKILL SPECIALTY
08 SUPPORT ITEM REQUIREMENTS BY MAINTENANCE CATEGORY
09 SUPPORT ITEMS LIST
10 SUPPORT ITEMS LIST
11 SPECIAL TRAINING DEVICE REQUIREMENTS
12 SPECIAL FACILITY REQUIREMENTS
13 SUPPORT EQUIPMENT REQUIREMENTS
14 TRAINING TASK LIST
20 TOOL AND EQUIPMENT REQUIREMENTS
26 REPAIR PARTS LIST
27 SPECIAL TOOLS LIST
28 CROSS REFERENCE INDEX
29 REPAIR PARTS LIST BY TM NUMBER
30 SPECIAL TOOLS LIST BY TM NUMBER
31 CROSS REFERENCE INDEX BY TM NUMBER
36 PROVISIONING DATA (MIL-STD-1552 FORMAT)

MRSA ROLE IN LSA

- **DEVELOP LSA GUIDANCE DOCUMENTS**
  - DARCOM-P 750-16, DARCOM GUIDE TO LOGISTIC SUPPORT ANALYSIS
  - LSA/LSAR FIVE YEAR ENHANCEMENT PLAN
  - DA PAM 750-21, LOGISTIC SUPPORT MODELING
  - DARCOM-P 750-11, SUPPORT MODEL REFERENCE LIST
  - DARCOM-C 700-4, LSA/LSAR TAILORING PROCEDURES GUIDE
  - DARCOM-C 700-7, LSA/LSAR REVIEW TEAM GUIDE
- **LSAR DEVELOPMENT**
  - LSAR DESIGN
  - PROGRAM AND DOCUMENTATION EXPORT
- **PROVIDE IMPLEMENTATION ASSISTANCE**

LSAR INSTALLATIONS



MATERIEL DEVELOPER RESPONSIBILITIES

- CONTRACT PREPARATION
- PROVIDE SOURCE DATA FOR LSA
- ESTABLISH AND IMPLEMENT DATA VERIFICATION PROCEDURES
- ENSURE DATA UTILIZATION

STATUS OF OSD/SERVICES LSA AND LSAR EFFORTS

JOINT SERVICES LSA WORKING GROUP

PURPOSE INTERSERVICE COOPERATION IN IMPLEMENTING AND STANDARDIZING LSA AND LSAR

MEMBERSHIP DARCOM, MRSA, USAF, NAVY, MARINE CORPS, INDUSTRY (AIA, EIA, NSIA)

MILESTONES

- FIRST MEETING - NOVEMBER 1978
- MOA ESTABLISHED - MARCH 1979
- LSAR UPDATE INITIATED - MAY 1979
- MIL-STD-1388 UPDATE INITIATED - JUNE 1979
- LSA SUPPORT ACTIVITY ALTERNATIVES DISCUSSED - MAY 1980
- LSA STEERING GROUP ESTABLISHED - SEP 1980
- MIL-STD-1388 UPDATE RESPONSIBILITY TO MRSA - SEP 1980

OSD - SERVICES - INDUSTRY LSA STEERING GROUP

ESTABLISHED 10 SEP 1980 BY ASD(MRA&L) MEMORANDUM

PURPOSE TO PLAN, COORDINATE, AND EXPEDITE THE DEVELOPMENT OF GUIDELINES FOR IMPLEMENTING THE LSA REQUIREMENTS IN DODI 5000.2 AND DODD 5000.39

MEMBERS

MR. RUSSELL SHOREY,
OASD(MRA&L) - CHAIRMAN

MR. RICHARD BIEDENBENDER,
OASD(MRA&L) - ALT. CHAIRMAN

MR. ROLAND BERG,
ODCSLOG - ARMY PRIMARY

MR. ROB ROY McGREGOR,
ODCSRDA - ARMY ALTERNATE

MR. OSCAR GOLDFARB
USAF

MR. FRANK SWOFFORD,
US NAVY

NSIA, EIA, AIA

MAJOR INITIATIVES

- UPDATE MIL-STD-1388, LOGISTIC SUPPORT ANALYSIS
- DEVELOP A DOD STANDARD LSAR
- ESTABLISH A DOD LSA SUPPORT ACTIVITY

MIL-STD-1388 (15 OCTOBER 1973)

LESSONS LEARNED:

- TOO GENERAL
- DIFFICULT TO TAILOR
- NOT PROPERLY APPLIED IN CONTRACTS
- ANALYSIS TASK RESULTS NOT LINKED TO DELIVERABLE DOCUMENTATION (DATA ITEM DESCRIPTIONS)
- REQUIREMENTS OUTDATED WITH NEW ACQUISITION POLICY (DODI 5000.2, DODD 5000.39, DODD 5000.40)
- DOES NOT ADEQUATELY ADDRESS EARLY MANPOWER AND LOGISTIC ANALYSIS REQUIREMENTS

LSA TASKS (MIL-STD-1388-1)

"THE RANGE AND DEPTH OF INDIVIDUAL TASKS SHALL BE DEFINED IN THE CONTRACT BY THE PROCURING ACTIVITY."

- USE STUDY
- HISTORICAL DATA REVIEW
- DESIGN PROJECTIONS
- FUNCTIONAL REQUIREMENTS IDENTIFICATION
- SUPPORT SYNTHESIS
- TRADE-OFF ANALYSIS
- COST FACTORS
- TIME FACTORS
- LOGISTIC DESIGN APPRAISAL
- SYSTEM IMPACT REVIEW
- LOGISTIC REQUIREMENTS IDENTIFICATION
- LSA DATA VERIFICATION
- ENGINEERING INTERFACING

EXAMPLE TASK DESCRIPTION

(MIL-STD-1388-1, 15 OCTOBER 1973)

DESIGN PROJECTIONS. DESIGN PROJECTIONS ARE CONCEPTUAL SYSTEMS/DESIGN ENGINEERING EFFORTS TO MEET THE STATED OPERATIONAL REQUIREMENTS. ENGINEERING AND LOGISTICS PERSONNEL SHALL PARTICIPATE IN THE ENGINEERING PROCESS TO ASSURE A BALANCE BETWEEN DESIGN AND SUPPORT REQUIREMENTS. DESIGN PROJECTIONS INFLUENCED BY HISTORICAL DATA, SUPPORT FUNCTIONAL REQUIREMENTS, AND CONSTRAINTS IMPOSED BY EXISTING LOGISTIC SYSTEMS SHALL BE UTILIZED AS SYSTEM DESIGN PROGRESSES TO DEFINITION OF HARDWARE. THEY SHALL FORM THE BASIS FOR SUPPORT SYNTHESES AND COST ANALYSES.

MIL-STD-1388 OUTLINE

15 OCTOBER 1973

MIL-STD-1388-1,
LOGISTIC SUPPORT ANALYSIS:

- SCOPE
- REFERENCED DOCUMENTS
- DEFINITIONS
- GENERAL REQUIREMENTS
- DETAILED REQUIREMENTS
- APPENDIX A - LSA SAMPLE DATA SYSTEM
- APPENDIX B - GLOSSARY

MIL-STD-1388-2,
LSA DATA
ELEMENT DEFINITIONS

JUNE 1981 (PROPOSED)

MIL-STD-1388-1,
LOGISTIC SUPPORT ANALYSIS:

- SCOPE
- REFERENCED DOCUMENTS
- DEFINITIONS
- GENERAL REQUIREMENTS
- TASK DESCRIPTIONS
- APPENDIX A - APPLICATION GUIDANCE
- APPENDIX B - GLOSSARY
- DATA ITEM DESCRIPTIONS

MIL-HDBK-XXX,
LSA DOCUMENTATION

TASK DESCRIPTION OUTLINE

- PURPOSE
- TASK DESCRIPTION
- DETAILS TO BE SPECIFIED BY THE REQUIRING AUTHORITY
- TASK INPUT
- TASK OUTPUT

MIL-STD-1388 (PROPOSED) - TASK CONTENT

TASK SECTION 100 -
PROGRAM SURVEILLANCE AND CONTROL

PURPOSE: TO PROVIDE FOR FORMAL LSA PROGRAM PLANNING AND REVIEW ACTIONS

TASKS:

101 - LOGISTIC SUPPORT ANALYSIS PLAN
102 - PROGRAM REVIEWS

MIL-STD-1388 (PROPOSED) - TASK CONTENT

TASK SECTION 200 - MISSION AND SUPPORT SYSTEMS DEFINITION

PURPOSE:

TO ESTABLISH LOGISTIC AND SUPPORT RELATED OBJECTIVES, DESIGN GOALS, THRESHOLDS, AND CONSTRAINTS THROUGH COMPARISON WITH EXISTING SYSTEMS AND ANALYSIS OF MANPOWER, COST, AND READINESS DRIVERS

TASKS:

201 - DEVELOPMENT OF MANPOWER AND SUPPORT INPUTS INTO PROGRAM INITIATION DOCUMENTS

202 - USE STUDY

203 - MISSION HARDWARE AND SOFTWARE STANDARDIZATION

204 - SUPPORT SYSTEM STANDARDIZATION

205 - COMPARATIVE ANALYSIS

206 - MANPOWER, COST, AND READINESS DRIVERS

207 - TARGETS OF OPPORTUNITY

208 - LOGISTIC AND SUPPORT RELATED DESIGN OBJECTIVES, GOALS AND THRESHOLDS, CONSTRAINTS AND RISKS

MIL-STD-1388 (PROPOSED) - TASK CONTENT

TASK SECTION 300 -
PREPARATION AND EVALUATION OF ALTERNATIVES

PURPOSE:

TO OPTIMIZE THE SUPPORT SYSTEM FOR THE NEW ITEM AND TO DEVELOP A SYSTEM WHICH ACHIEVES THE BEST BALANCE BETWEEN COST, SCHEDULE, PERFORMANCE, AND SUPPORTABILITY

TASKS:

301 - FUNCTIONAL SUPPORT REQUIREMENTS

302 - SUPPORT SYSTEM ALTERNATIVES

303 - EVALUATION OF ALTERNATIVES AND TRADEOFF ANALYSIS

MIL-STD-1388 (PROPOSED) - TASK CONTENT

TASK SECTION 400 -
DETERMINATION OF SUPPORT RESOURCES

PURPOSE: TO IDENTIFY THE LOGISTIC SUPPORT RESOURCE REQUIREMENTS OF THE NEW SYSTEM IN ITS OPERATIONAL ENVIROMENT(S)

TASKS:

401 - DETERMINATION OF NEW OR CRITICAL SUPPORT RESOURCES

402 - SUPPORT TASK ANALYSIS

403 - LOGISTIC SUPPORT RESOURCE ANALYSIS

MIL-STD-1388 (PROPOSED) - TASK CONTENT

TASK SECTION 500 - SUPPORTABILITY ASSESSMENT

PURPOSE: TO ASSURE THAT SPECIFIED SUPPORTABILITY REQUIREMENTS ARE ACHIEVED AND DEFICIENCIES CORRECTED

TASKS:

501 - SUPPORTABILITY TEST AND EVALUATION

502 - SUPPORTABILITY VERIFICATION

MIL-STD-1388 UPDATE STATUS

- UPDATE INITIATED - OCTOBER 1979 (AIR FORCE)
- RESPONSIBILITY ASSIGNED TO MRSA - SEPTEMBER 1980
- MRSA DRAFT COMPLETED - MARCH 1981
- WORKING GROUP COMMENTS FINALIZED - MAY 1981
- UPDATED MRSA DRAFT - AUGUST 1981
- MANPOWER, PERSONNEL, AND TRAINING INPUT - SEPTEMBER 1981
- SERVICE AND INDUSTRY STAFFING - OCTOBER 1981
- PUBLICATION - SEPTEMBER 1982

DOD LSA SUPPORT ACTIVITY MAJOR TASKS

- MIL-HDBK-XXX, LSA DOCUMENTATION
  - DOD LSAR DATA SHEETS
  - DOD LSAR DATA ELEMENT DICTIONARY
  - DOD LSAR OUTPUT REPORTS
  - NON LSAR DATA
- DOD LSAR ADP SYSTEM
  - FUNCTIONAL AND ADP DOCUMENTATION
  - ASSISTANCE AND TRAINING IN USE OF LSAR
- OUTPUT PRODUCTS TAILORED TO SERVICE REQUIREMENTS
  - PROVISIONING TECHNICAL DOCUMENTATION
  - SERD/GSERD'S
  - HUMAN ENGINEERING/TRAINING TASK REPORTS
  - CALIBRATION/MEASUREMENT REQUIREMENTS SUMMARY
  - TEST MAINTENANCE SUMMARY
- LSAR CERTIFICATION PROGRAM FOR CONTRACTOR DEVELOPED LSAR ADP SYSTEMS

DOD LSA SUPPORT ACTIVITY MAJOR TASKS (CONTINUED)

- LSAR DATA FILE INTERFACE WITH RLA MODELS, LIFE CYCLE SUPPORT COST MODELS, AND READINESS ANALYSIS MODELS
- ENHANCED DATA PROCESSING TECHNIQUES FOR LSAR
  - INTERACTIVE CAPABILITY (I.E. DBMS)
  - AUTOMATED GENERATION OF DATA (I.E. PROVISIONING DATA FROM R&M)
  - USE OF OTHER ENGINEERING DATA FILES (TECH DATA/ CONFIGURATION MANAGEMENT FILES)
  - AUTOMATION OF ALL LSAR DATA SHEETS
  - INCORPORATE TEXT EDITING CAPABILITIES
- ENHANCEMENT PLAN
- ASSISTANCE AND ORIENTATIONS

TRADOC/DARCOM

MEMORANDUM OF UNDERSTANDING

IMPLEMENTATION OF AR 700-127

1 APR 81

PRIME ILS RESPONSIBILITIES

DARCOM/TRADOC

MILESTONE 0 — MILESTONE 1 — IOC

TRADOC — PRIME RESPONSIBILITY — DARCOM

ILS MANAGER - TRADOC

- ASSIGNMENT OF TSM AT MILESTONE 0
- DEVELOPS ILS "DESIGN = TO" REQUIREMENTS
- MISSION/USER ORIENTED

ILS MANAGER = DARCOM

- DESIGN = ACQUISITION = TEST - AND DEPLOYMENT OF ILS

DARCOM SUPPORT

- DEVELOPS ILS PLAN FOR ACQUISITION OF ILS ELEMENTS
- SUPPORTS TRADOC WITH DEVELOPMENT OF ILS DESIGN = TO REQ'S

TRADOC SUPPORT

- MANPOWER & LOGISTIC ANALYSIS
- MOS TRAINING
- ILS MGT TEAM MEMBER (USER REPRESENTATIVE)

OBJECTIVE

TO DEFINITIZE THE TRADOC/DARCOM RELATIONSHIPS IN PERFORMANCE OF THE INTEGRATED LOGISTIC SUPPORT (ILS) ACTIONS REQUIRED BY AR 700-127, INTEGRATED LOGISTIC SUPPORT.

MAJOR EMPHASIS

TO ASSIGN LEAD RESPONSIBILITY FOR INDIVIDUAL ILS ACTIONS

TO IDENTIFY REQUIREMENTS FOR COORDINATION BETWEEN DARCOM AND TRADOC.

TRAINING DEVELOPMENT ROLE IN INTEGRATED LOGISTIC SUPPORT (ILS)

UNITED STATES ARMY TRAINING SUPPORT CENTER

ATIC-DST-SP

JOHN C. HOULIHAN

TRAINING DEVELOPMENT ROLE IN INTEGRATED LOGISTIC SUPPORT (ILS)

The ATSC Skill Performance Aids Division is responsible for the policy involved with the contracting of Extension Training Material (ETM) which is based upon the Technical Manual (TM). We advise the TRADOC schools on policy and conduct an Assistant Contracting Officer Representative (ACOR) course every other month, which is hosted by a TRADOC school.

In order to identify the requirement for ETM, we must first understand what the TM should be and therefore how it should be developed. The TM was an engineer manual written for and by engineers. It was a reference book which was used by Senior NCOs to preview before performing maintenance and reviewing afterward. Due to the proliferation of equipment and the sophistication of technology today, we must have a TM which can assist the Advanced Individual Training (AIT) graduate in task performance under given conditions and enable him to meet the standards required. The TM is equipment oriented only. It does not address doctrine or tactics. All tasks are addressed in step-by-step sequence. The task contains a layout of all tools used, number and MOS of people involved, equipment condition necessary to perform this task, and cautions and/or warning involving safety for each task. This is a far departure from the old TM. Let's look at a page from the old style TM. (SLIDE #1 ON). This is a page from a Landing Craft Utility (LCU) electrical system which involves a 61C MOS. As depicted here, one must flip throughout the TM in order to find diagrams, figures, and tables. Perhaps a 61C30 could follow these instructions, but a 61C10 could not and the 10 level is our target audience. (SLIDE OFF).

Since the TM must support training, we should understand the development process for new systems which incorporate ILS and Logistic Support Analysis (LSA).

During the previous presentation, you have an overview of what LSA/LSAR is and what is becoming available to you. I would like to re-emphasize the importance of the "data call" and the use of DARCOM Circular 700-4 and DARCOM Pam 750-16, which outlines the LSA/LSAR tailoring procedures. (SLIDE # 2 ON). ILS encompasses manpower, personnel, training, and logistics. All of these factors must be identified early in the program, if the developing system is to be affected. (SLIDE OFF).

Analysis and updating are required continually throughout the development cycle of a system. (SLIDE #3 ON). Our training analysis starts with the Operation and Organization Statement which is one of the driving documents, initiating the Life Cycle System for a Developing System. An outline of the Individual and Collective Training Plan (OICTP) is initiated as a part of the Letter of Agreement (LOA). This document is outlined in TRADOC Cir 351-8 and is the basis from which the training community obtains training, devices, and products which are directly tied into the Developing System on a scheduled program. The ILS manager during the Concept Stage is TRADOC. The contractor receives a Target Audience Description (TAD), which lists the basic skills learned in Advanced Individual Training by the soldier, his mission assignment extracted from AR 611-201, and his reading grade level. The hardware and missi are analyzed and yield total task lists. Based on critical tasks to be trained, total skills required by the new system are derived. Requirements for training and devices are identified at this point. (SLIDE OFF).

In order to obtain the maximum benefit from LSAR, we, the "trainers", must closely coordinate with the Combat Developers (CD) within our schools. CD is primarily involved with the future battle field and are therefore hardware oriented. In analyzing missions, the CD may decide to purchase Non-Developmental Items (NDI) or off-the-shelf commercial items for which there is no training plan or program. This may solve a quick-fix now, but as trainers, we will still be playing catch-up after the item is put in the disposal yard. TRADOC has a Memorandum of Understanding (MOU) with DARCOM, that no commercial manual (TM) will be purchased unless the manual is verified by the Target Audience (TA) (AIT graduates with basic skills in a career field). If the TA cannot take the commercial manual and perform each task which, as a result of analysis, has been identified for training necessary to maintain the hardware, then the manual is not adequate and should not be purchased. Resources are crucial within TRADOC. Communications and close coordination with CD is a must. Early identification of training, personnel, manpower, and logistics is essential in order to maximize the benefits from early R&D. Sophisticated equipment support is expensive. System X coming off the production line with all of the products involved costs $3 million. The System Support Package (SSP), to include properly verified TMs cost $5 million. In the past we have been offered three of X with no SSP or one complete System X with its SSP. If money alone is the constraint, buy one COMPLETE system. Technology is advancing too fast for us to play catch-up later. (SLIDE #4 ON). This Developmental Cycle here depicts only the four phases that we are interested in. In the Concept Phase under the LOA, our OICTP is submitted. After Operational Test I, the outline is fleshed out and becomes the Individual and Collective Training Plan (ICTP). Testing issues are planned for and a Training Plan is formulated for the Operational Test II TA troops. As this is purified, it will be a major

portion of our Verification Plan for the TM, and training products (SLIDE OFF) ETM requirements will be verified as well. Only a change in the hardware during Production Phase should affect our training subsystem.

A more detailed look at our role within the Life Cycle System Management Model (LCSMM) is shown here, beginning with the Conceptual Phase. We determine our needs based on the impact that a new system will have on our existing training base. (SLIDE #5 ON). We look at similar systems that are in existence and predict the shortcomings over what will be needed. The CD develop the MENS - Mission Element Needs Statement and the Organizational and Operational Concept. DARCOM develops the Material Concept, however, in each case there are training, personnel, manpower, and logistic issues which we must address and exert a direct influence as early as possible for inclusion into the new developing system. Our outline of the Individual and Collective Training Plan (OICTP) becomes incorporated into the Letter of Argeement which finishes Milestone One of the LCSMM.

The Operational Test I (OTI) tests the training issues addressed in the OICTP. Alternative designs are also evaluated too. Critical tasks for training are identified and the criteria is formalized for use by the contractor. Preliminary task analysis is being conducted. Test issues are developed for Operational Test II (OT II) and a training plan is developed for TA troops who should be used in OT II. The contractor receives his TAD and begins to formulate his New Equipment Training (NET) program. Issues that we consider essential in a NET program to support our ICTP must be given to the contractor at this point. We must review the Outline of the Acquisition Plan (OAP) to insure that our training, personnel, manpower, and logistic issues are covered.

Our OICTP is updated and becomes our ICTP. The Required Operational Capability (ROC) or Letter Requirement (LR) is reviewed for training issues. At this point, in the DEVAL phase, any influence that we may have on training issues is finished. The contractor has direction in which to go and will be solidifying his production.

Full Scale Engineering Development (FSED) begins with OT II which should verify our ICTP, through the use of TA troops. If we feel that critical issues are not addressed or complete, we may ask for a Data Call (DOD Instruction 5010.12) and ask for additional LSA items or tailor existing ones to meet specific problem areas. The contractor now conducts training for the Instructors and Key Personnel (I&KP). An updated OAP is reviewed and we must insure that training is correct and all inclusive. The Task List for training is updated and reviewed. A Training Test Support Package is made up which will include:

a. Requirements/plans for instructors.

b. Course of instructions.

c. Training documents.

d. Training Data Collection Requirements.

e. Lesson Plans.

f. Personnel selection criteria.

g. Training aids or simulators.

h. Plan to test user troops for OT II (DA Pam 700-127).

A final list of tasks selected for training is now generated. The training site is selected and coordinated. The ICTP is updated based on OT II results.

The final phase that we have an interest in is the Production and Development.

Our training program is implemented. DARCOM delivers a new program of Instruction from the NET package and our training product schedules are firmed up. (SLIDE OFF).

Technology is rapidly advancing and the number of new systems going to the field is unending. The ability to "catch-up" in the training arena is no longer available and applicable. As trainers, we learn to use the new technology (LSA/LSAR) to enhance our training and influence the developing system at its conception, or we wake up to find an impossible task with the result of no training available to support the Army in the field.

5-2. TEST EQUIPMENT AND SPECIAL TOOLS.

The only equipment needed for the trouble shooting test outlined herein are a standard 20,000 ohms volt voltohmmeter and a 1000 c.p.s signal source (see table 5-2)

TABLE 5-2. PUBLIC ADDRESS SET TYPE AN/PIC-2, TEST EQUIPMENT REQUIRED

NAME	TYPE NO	ALTERNATE	USE
Multimeter	SIMPSON 260	AN/PSM-4	Voltage measurements, Resistance measurements, Continuity checks
Audio Signal Generator	HP-200-AB		1000 cycle source

CAUTION

REMOVE TRANSISTORS FROM CIRCUIT BEFORE MAKING RESISTANCE MEASUREMENTS. USE A HEAT SINK IN SOLDERING AND UNSOLDERING TRANSISTOR LEADS.

5-3. OVERALL TROUBLE SHOOTING.

a. PRELIMINARY CHECK. — *After the check tests* outlined in table 5-1 are made, more extensive tests can be made to locate the cause of malfunctioning. Where trouble has been indicated in the power switching circuits, ordinary continuity checks should first be made. These circuits, up to the feed-thru power terminals on the driver unit, can be checked after removing the dry batteries to gain access to the battery output terminals in the lung contact board, figure 4-4, item 90, and by removing the handle cover, figure 4-4, item 78, to make the terminals of the switches available. Continuity and closure of switches, can be checked with the ohmmeter by following the wiring diagram, figure 5-2

b. TEST OF TRANSDUCERS.

(1) TEST OF MICROPHONE. — The microphone unit can be given a preliminary check also. Remove the microphone cover figure 4-4, item 35, making the insulated feed thru terminals accessible (see figure 4-5). Turn the volume control to high and check the resistance across these terminals. A normal microphone unit will give a reading close to 30 ohms and in addition a click will be heard in the microphone.

(2) TEST OF LOUDSPEAKER. — The loudspeaker driver unit can be given a preliminary test before tests are initiated on the amplifier module. Remove the rear housing from the driver unit head as described in Section 4. Setting the horn on its bell permits easy access to the driver unit with the housing hanging alongside by the connecting wires, as shown in figure 3-4. Remove the snap on connectors from the amplifier output tabs marked "LINE" and "COM". Check the driver unit resistance across the "LINE" and "COM" terminals for a normal reading close to 10 ohms. A click should be heard in the loudspeaker at the same time. If no trouble has been found up to this point further tests must be made on the amplifier.

5-4. FUNCTIONAL TROUBLE SHOOTING.

a. GENERAL. — Figure 4-3 is a complete electrical schematic of the loud hailer. Positive and negative buses are designated test points as either one or the other are used in checking the normal voltages or resistances of the circuit. These test points are indicated in the illustration, figure 4-7.

b. AMPLIFIER SECTION.

(1) PRELIMINARY. — In order to shoot trouble in the amplifier, the module must be removed from the rear housing. First disconnect the six wires by removing the snap on connectors from the tabs on the chassis. Remove the three amplifier mounting screws figure 4-4, item 65. Slide out the amplifier module from the housing and place on a working surface, with the power transistors down. Remove the two screws, figure 4-4, item 88, which secure the phenolic board to the assembly. This board can now be hinged up and out on its cable and laid flat as shown in the illustration figure 4-7.

(2) RESISTANCE MEASUREMENTS. — Most causes of malfunctioning are due to a faulty component open or shorted wiring, or a loose or cold soldered joint which may have developed. These defects can usually be localized by conventional resistance measurements when these vary markedly from the normal values that should be obtained. Table 5-3 lists the normal resistance readings to be obtained across all points in the circuit necessary to localize defects, and in addition lists the possible faults indicated by abnormal resistance reading. Test point A is the positive bus of the circuit, and test point B is the negative bus. All readings are in ohms and are measured with any standard 20,000 ohm per volt ohmmeter. Transistors Q2, Q3, and Q4 are removed for this test and at least two leads of Q1 are unsoldered from their lugs. Use a hot iron and hold the leads with a long nose plier to conduct heat away from Q1 and unsolder quickly.

Note that the nominal resistance of the particular component is not measured in all cases, in as much as there are other components forming a network shunting the component. The median readings are given in each case for the combination of shunting effects — for instance in measuring R2 a reading of 1300 ohms nominal is obtained, instead of 27K. Here R2 is shunted by R3 in series with RT1 and the combination of T2 terminals 4-5, R9, L1 terminals 2-3 in parallel with T2 terminals 3-4, R11, L1 terminals 1-2. Confirmation of a defective transformer winding can be checked against the values given in the transformer table figure 4-3, after unsoldering the connections to this transformer.

Attention is called to the tantalytic capacitors which have a different resistance in either direction of polarity

ILS

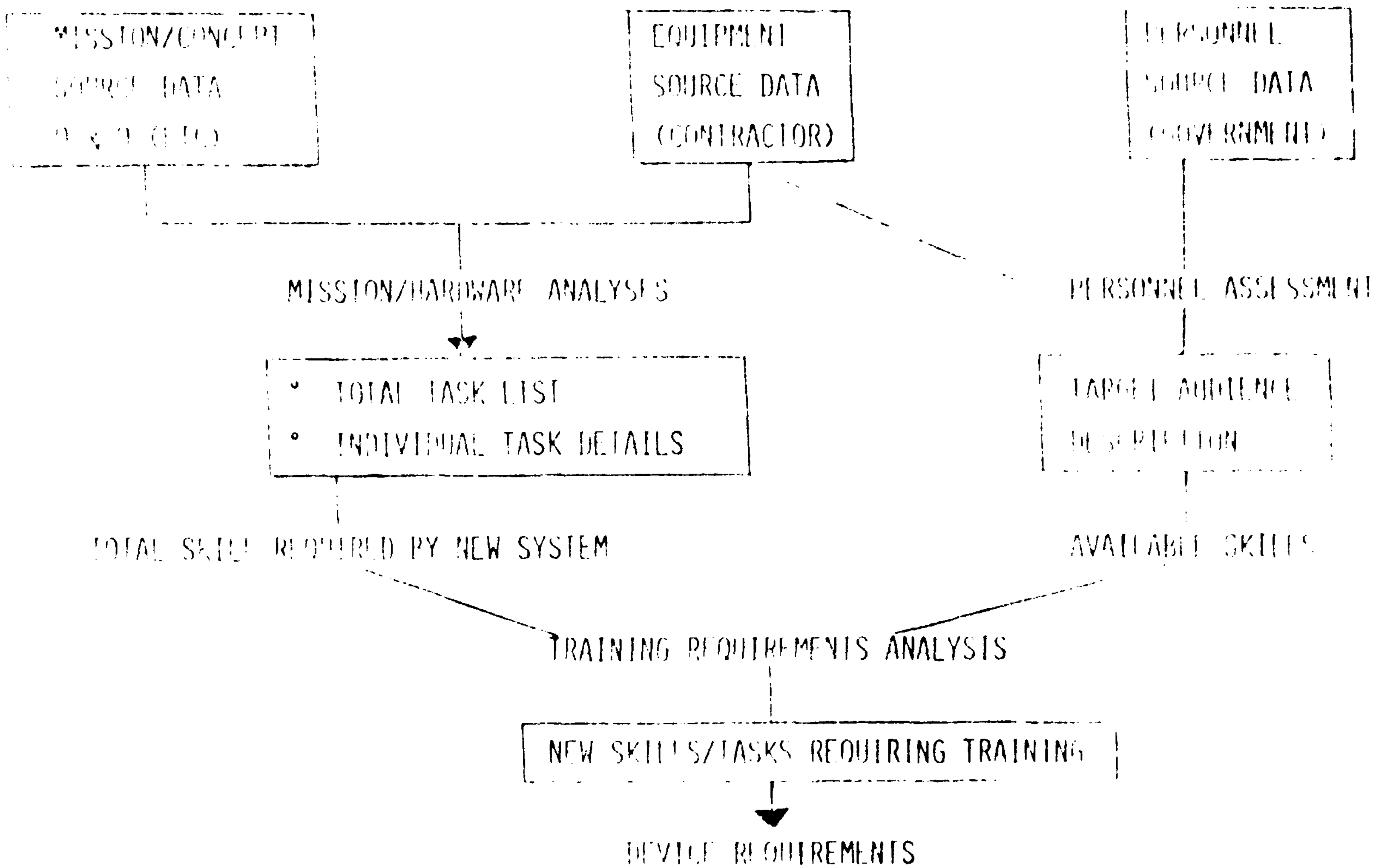
MANPOWER ▼ PERSONNEL ▲ TRAINING ▲ LOGISTICS ▼

LOGISTIC SUPPORT ANALYSIS/RECORD

LSA/LSAR

#2

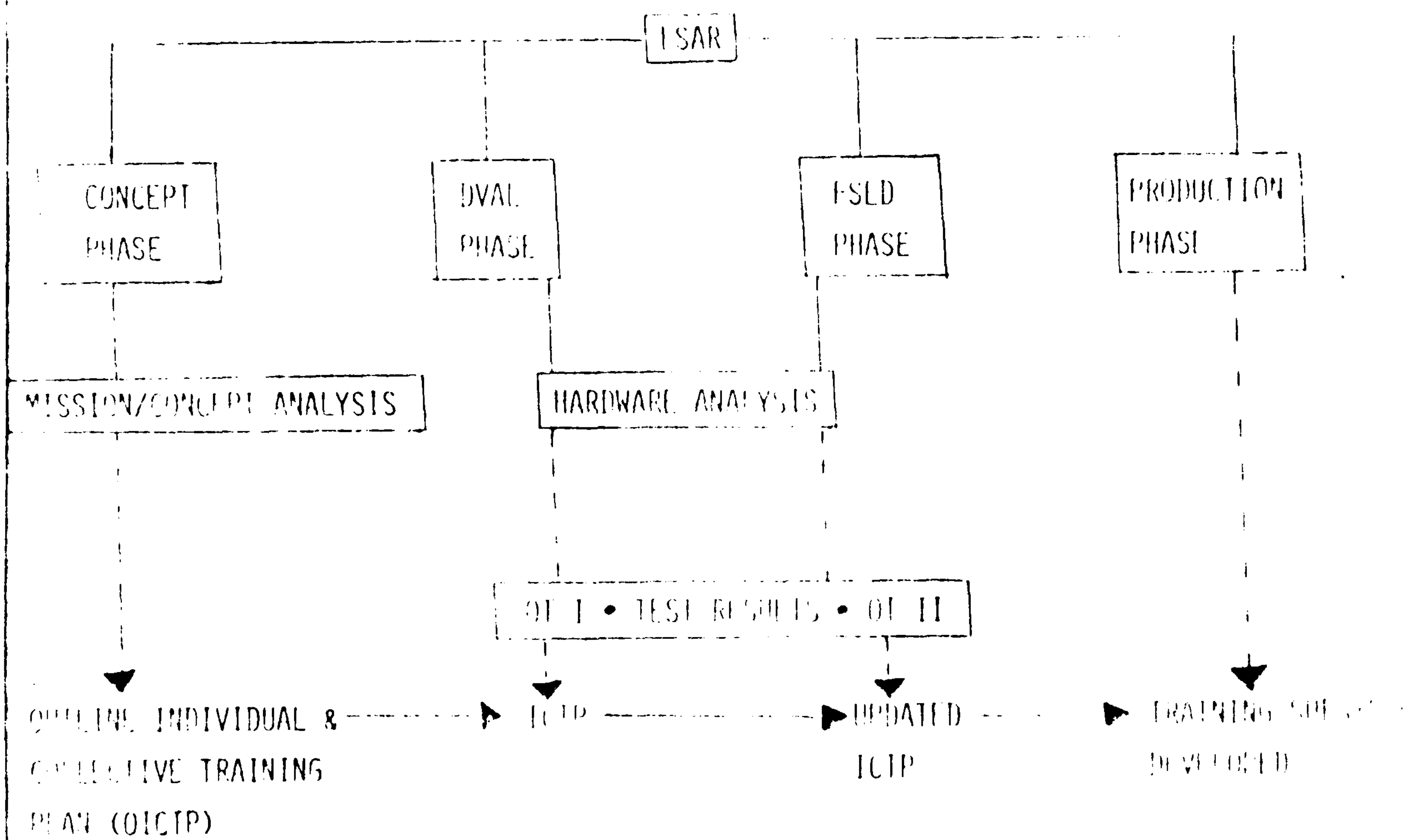
ANALYSES REQUIRED UNDER LSA FOR DETERMINATION OF TRAINING REQUIREMENTS



#3

GEMINI

ILS AND THE TOTAL TRAINING SUBSYSTEM



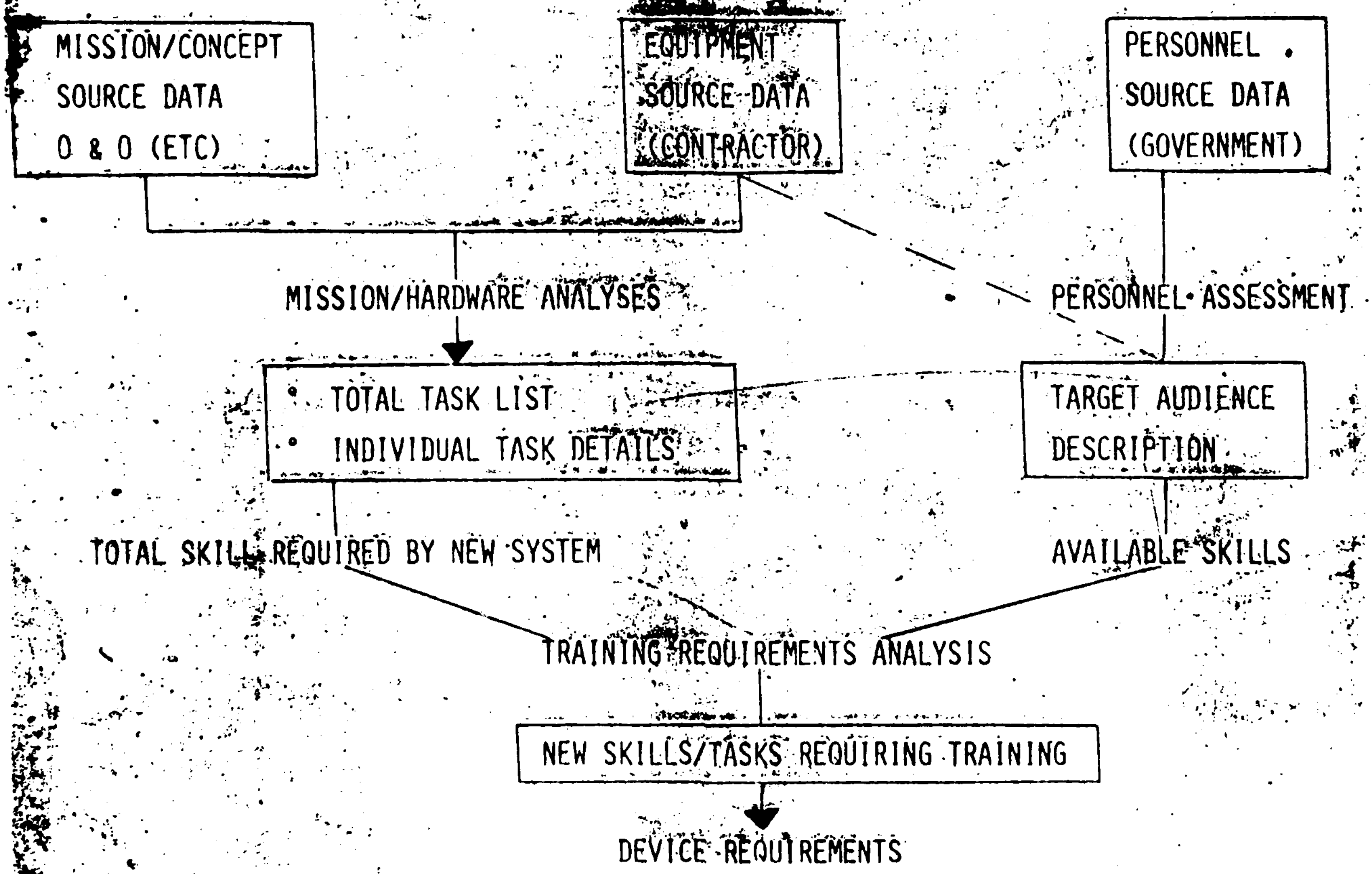
#4

GEMINI

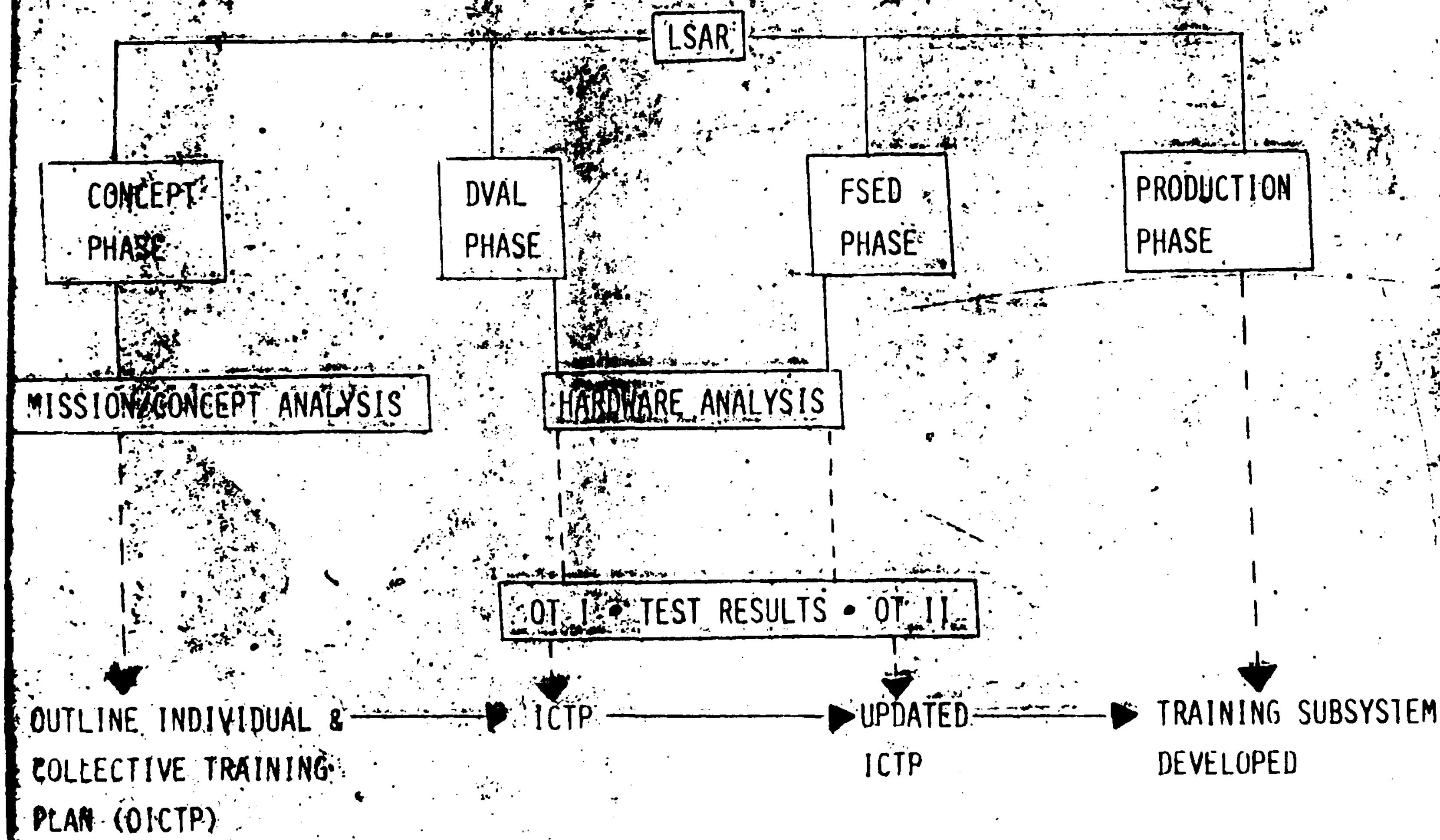
RELATIONSHIP OF TRAINING SUBSYSTEM TO LCSMM

	CONCEPTUAL PHASE	DEVELOPMENT & VALIDATION PHASE	FULL SCALE DEVELOPMENT	PRODUCTION DEPLOYMENT
WHAT IS NEEDED	DETERMINE IMPACT OF NEW SYSTEM ON TRAINING REQUIREMENT	EVALUATE TRAINABILITY (OT I) EVALUATE ALTERNATIVE DESIGNS	VALIDATE TRAINING PKG (OT II)	IMPLEMENT TRAINING PROGRAM
INPUTS REQUIRED	• MENS • ORGANIZATIONAL & OPERATIONAL CONCEPT • MATERIEL CONCEPT	• IDENTIFICATION OF CRITICAL TASKS • PRELIMINARY TASK ANALYSIS • CONTRACTOR NET • ACQUISITION PLAN	• TASK ANALYSIS-(LSA/LSAR) • I & KPT • UPDATED ACQUISITION PLAN • TENTATIVE LIST OF TASKS FOR TRAINING	OT II RESULTS
TRAINING OUTPUTS	• TRAINING PLAN (OICTP) • TRAINING ISSUES INPUT TO LOA	• ICTP • TRAINING ISSUES INPUT TO ROC/LR	• TRAINING TEST SUPPORT PACKAGE • FINAL LIST OF TASKS FOR TRAINING • SITE SELECTION • UPDATED ICTP BASED ON OT II RESULTS	• ACHIEVE RESIDENT TRAINING CAPABILIT' • NETT • EXPORTABLE TNG MATERIAL • SM/TG • SQT • ARTEP

ANALYSES REQUIRED UNDER LSA FOR DETERMINATION OF TRAINING REQUIREMENTS



ILS AND THE TOTAL TRAINING SUBSYSTEM



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LSA/LSAR

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